


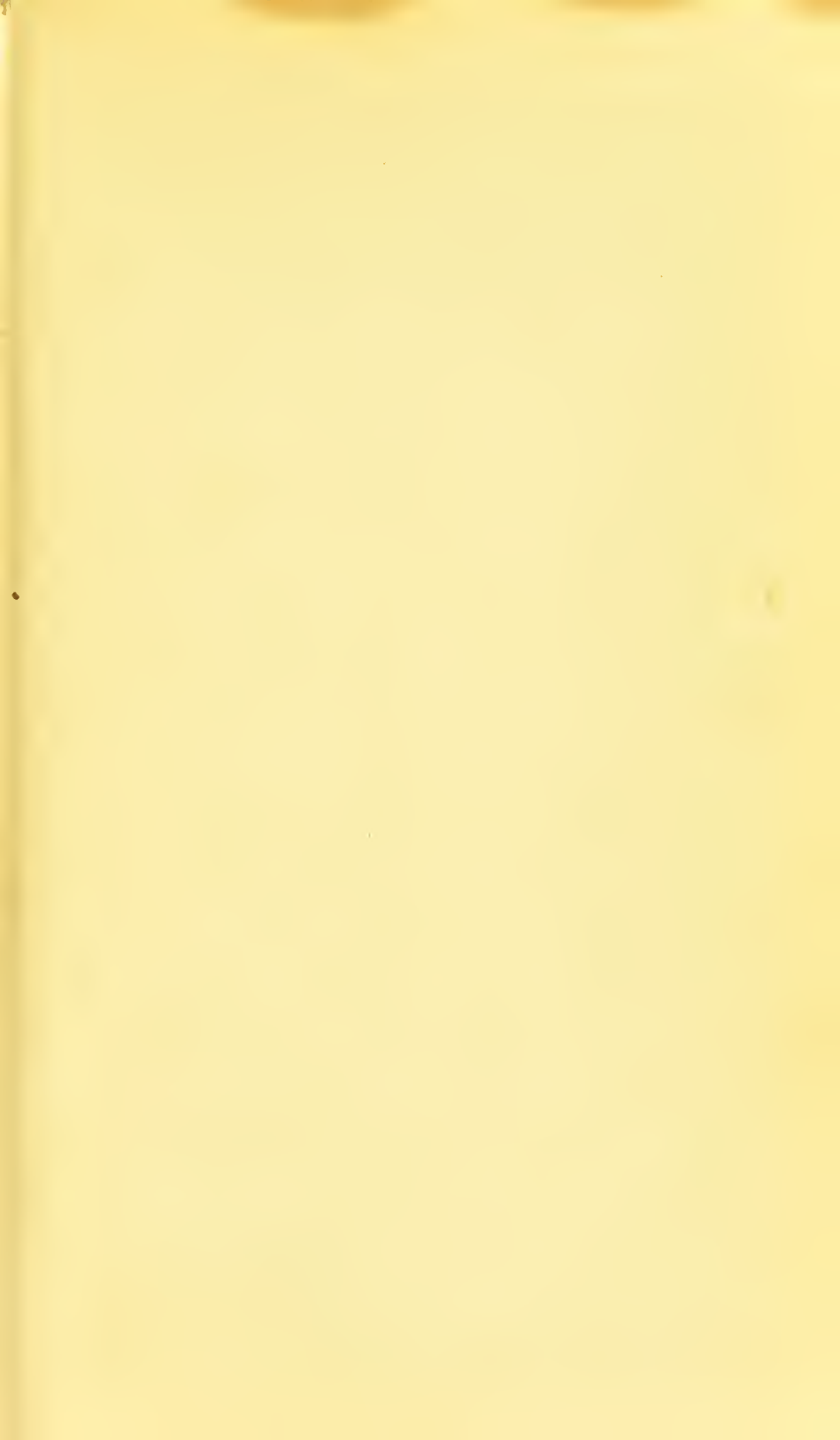
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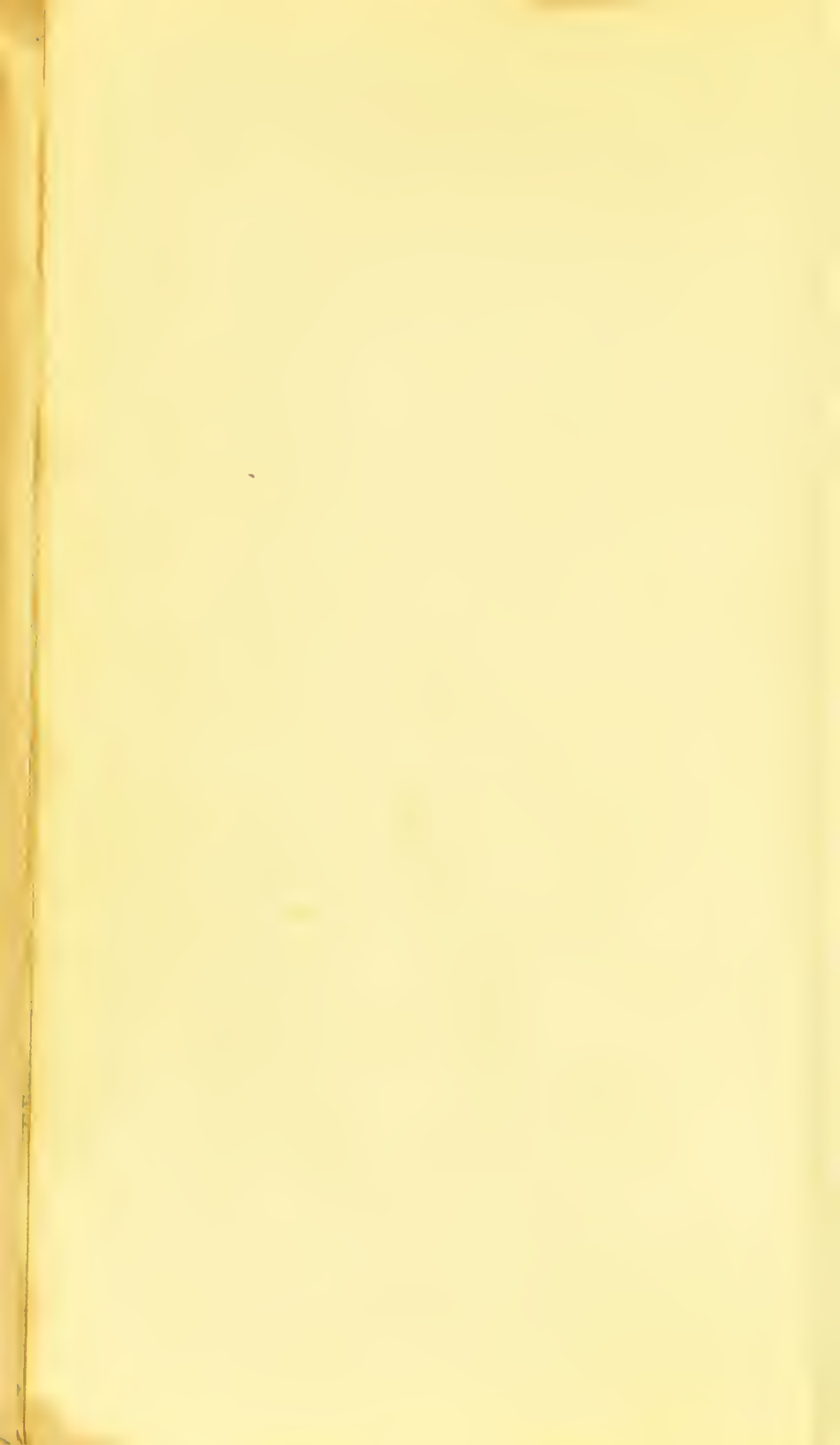




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USEFUL KNOWLEDGE :

OR

A FAMILIAR ACCOUNT

OF THE

VARIOUS PRODUCTIONS

OF

Nature,

MINERAL, VEGETABLE, AND ANIMAL,

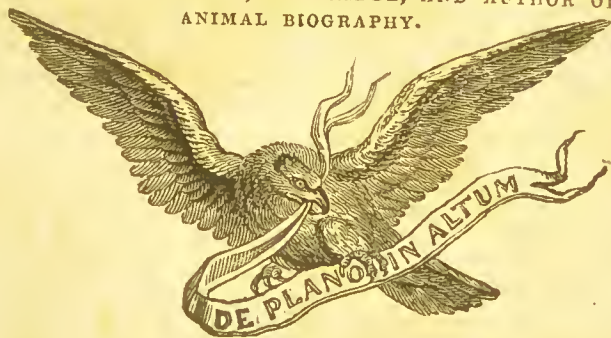
WHICH ARE CHIEFLY EMPLOYED FOR THE USE OF MAN.

*Illustrated with numerous Figures, and intended as a Work
both of Instruction and Reference.*

BY THE

REV. WILLIAM BINGLEY, AM. FLS.

LATE OF PETERHOUSE, CAMBRIDGE, AND AUTHOR OF
ANIMAL BIOGRAPHY.



IN THREE VOLUMES.

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FOURTH EDITION.

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EXPLANATION OF THE PLATES

OF THE

THIRD VOLUME.



FRONTISPIECE: PLATE I.

HEADS, &c. OF QUADRUPEDS, UPON AN OUTLINE OF THE
HEAD OF THE GREAT WHALE.

Fig.		Fig.	
1.	Rhinoceros.	10.	Fallow deer.
2.	Seal.	11.	Chamois.
3.	Cat.	12.	Antelope.
4.	Sable.	13.	Goat.
5.	Bear.	14.	Sheep.
6.	Badger.	15.	Bison.
7.	Camel.	16.	Hog.
8.	Elk.	17.	Outline of the head of the Great Whale.
9.	Stag, or red deer.		

PLATE II.

PARTS OF MAMMIFEROUS ANIMALS.

18.	Manis.	25.	Beaver.
19.	Armadillo.	26.	Hare.
20.	Elephant.	27.	Musk.
21.	Spaniel.	28.	Rein-deer.
22.	Greyhound.	29.	Ox.
23.	Mastiff.	30.	Horse.
24.	Fox.		

PLATE III.

PARTS OF BIRDS.

31.	Falcon.	34.	Pheasant.
32.	Bird of paradise.	35.	Cock.
33.	Crowned pigeon.	36.	Red Grouse.

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Fig.	Fig.
37. Black Grous.	45. Woodcock.
38. Ptarmigan.	46. Ruff.
39. Bustard.	47. Swan.
40. Ostrich.	48. Eider duck.
41. Heron.	49. Puffin.
42. Bittern.	50. Penguin.
43. Snipe.	51. Gannet.
44. Curlew.	

PLATE IV.

REPTILES AND FISHES.

52. Turtle.	59. Torsk.
53. Imbricated Turtle.	60. Burbot.
54. Guana.	61. Thunny.
55. Eel.	62. Gurnard.
56. Muræna.	63. Tench.
57. Sword-fish.	64. Dog-fish.
58. Cod.	

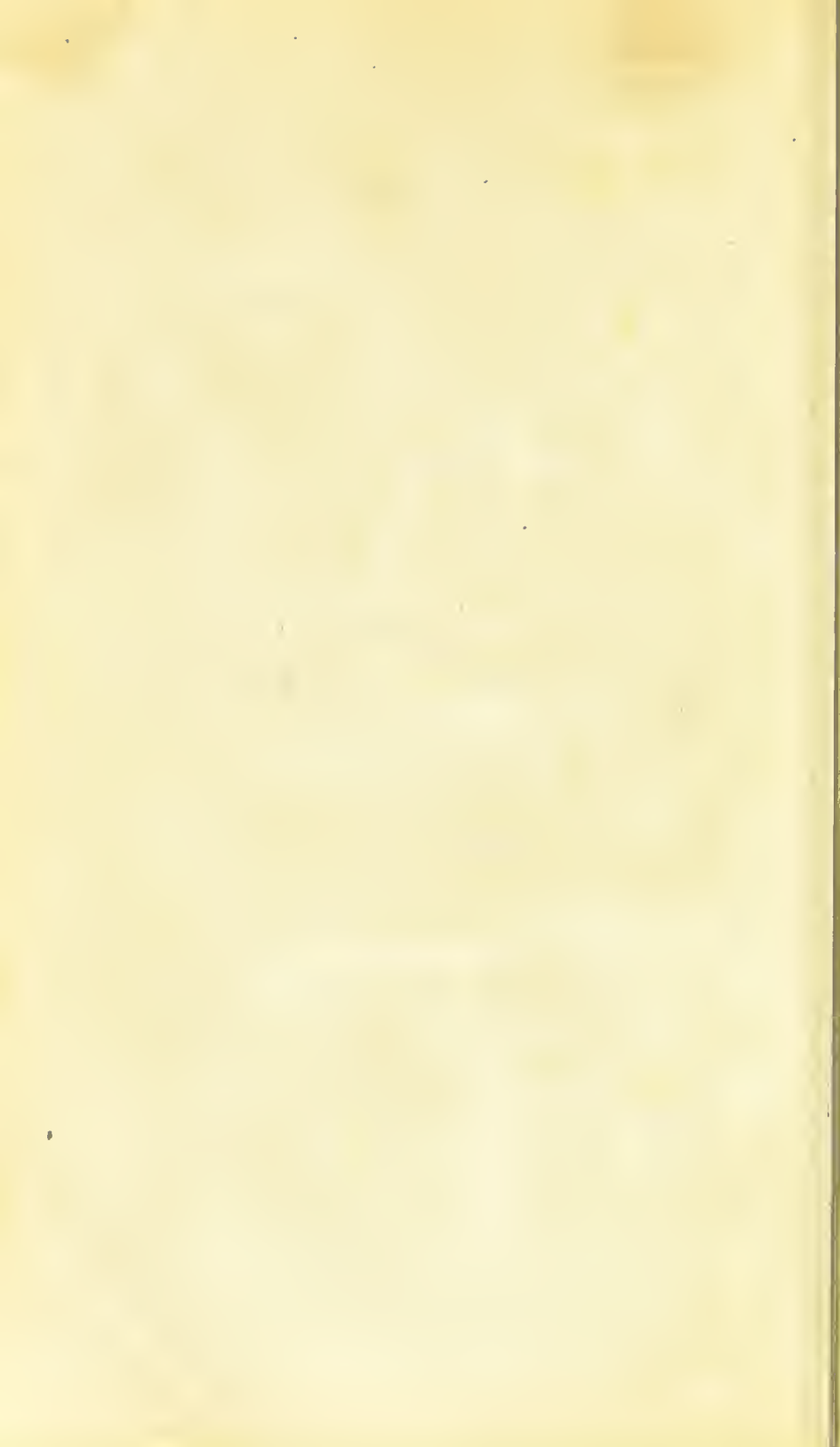
PLATE V.

FISHES, &c.

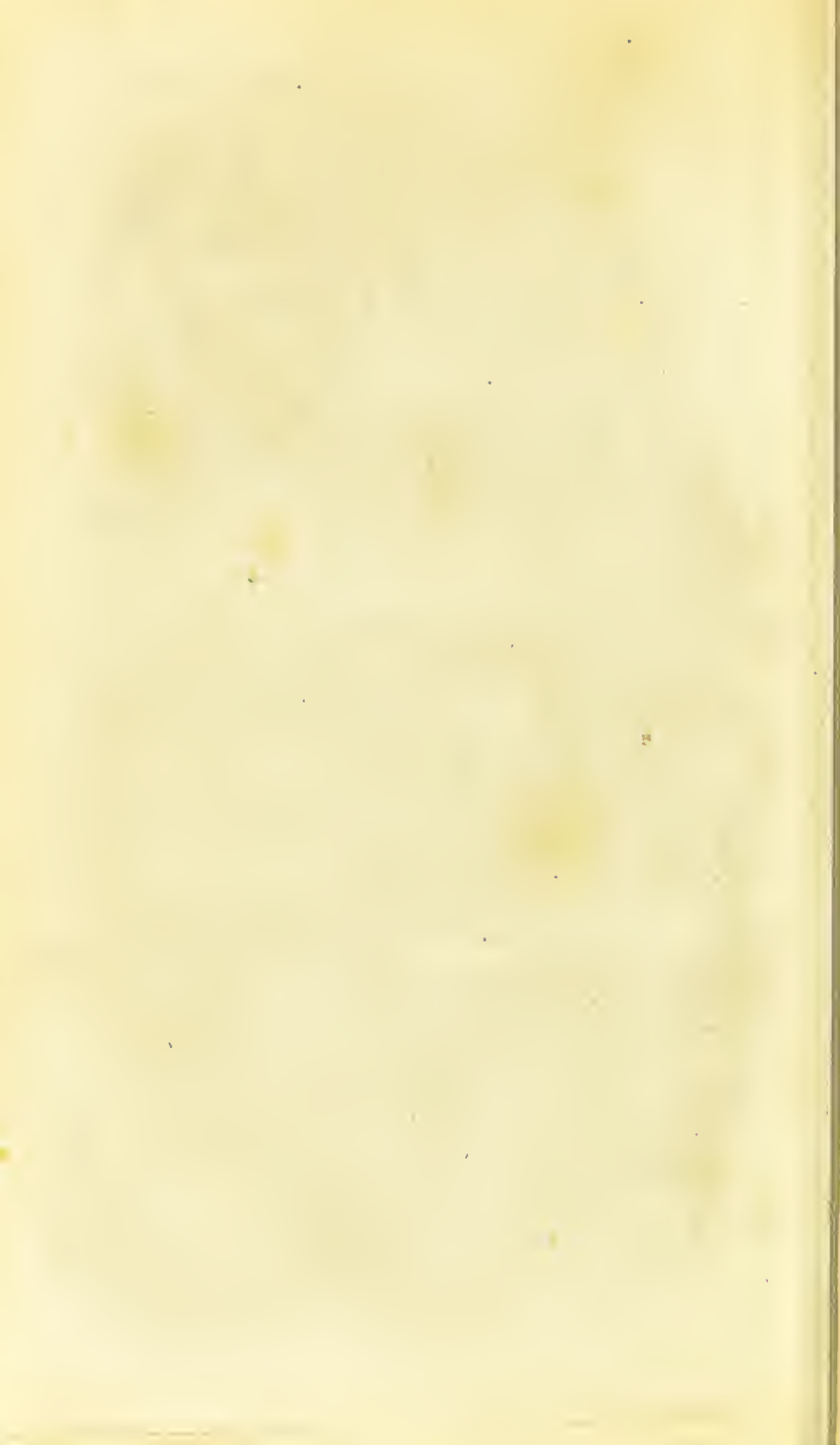
65. Dorée.	73. Lamprey.
66. Turbot.	74. Lobster.
67. Surmullet.	75. Prawn.
68. Salmon.	76. Crab.
69. Gar-fish.	77. Oysters.
70. Carp.	78. Scallop.
71. Sturgeon.	79. Muscle.
72. Skate.	80. Cockle.

ANIMALS.





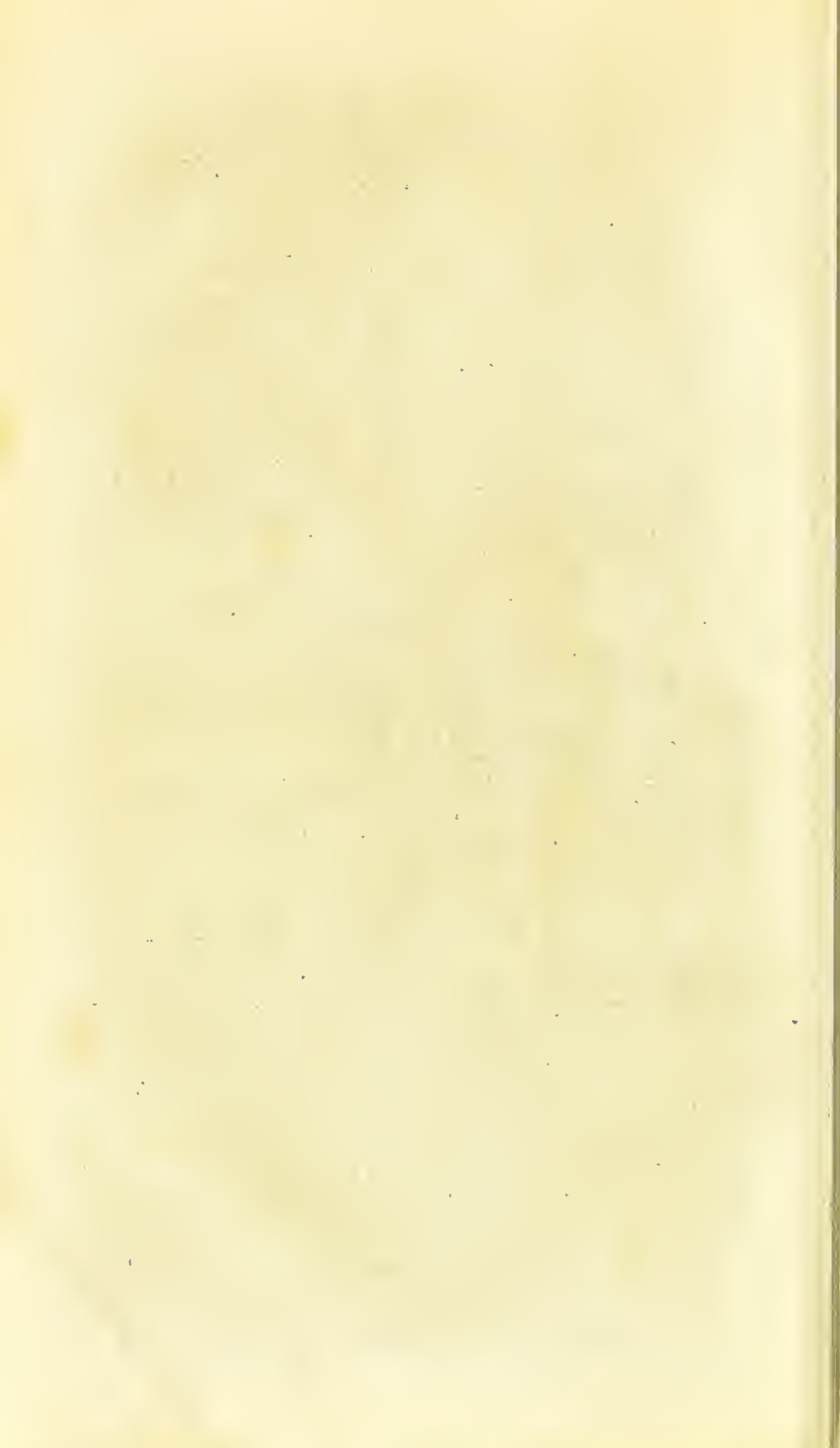


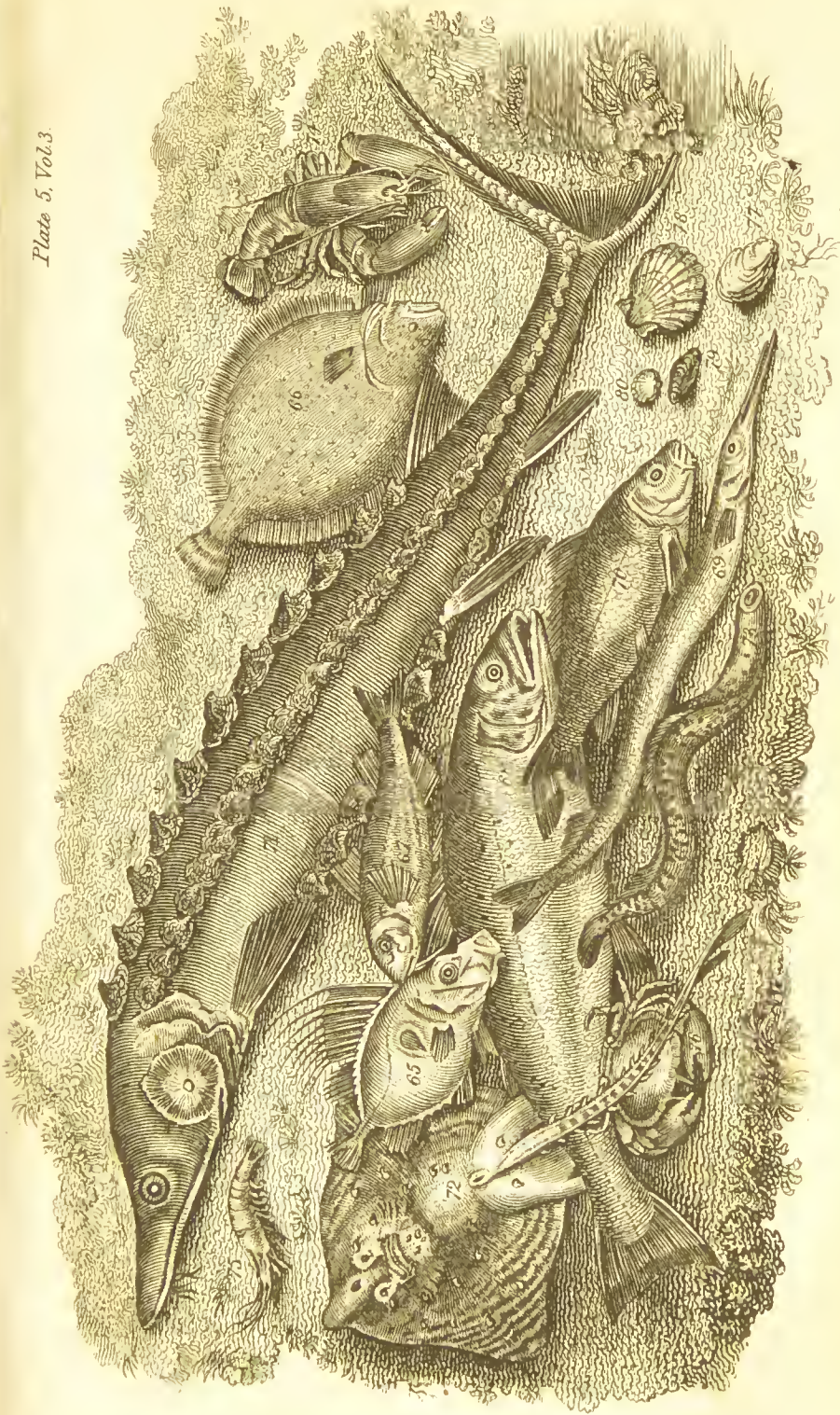


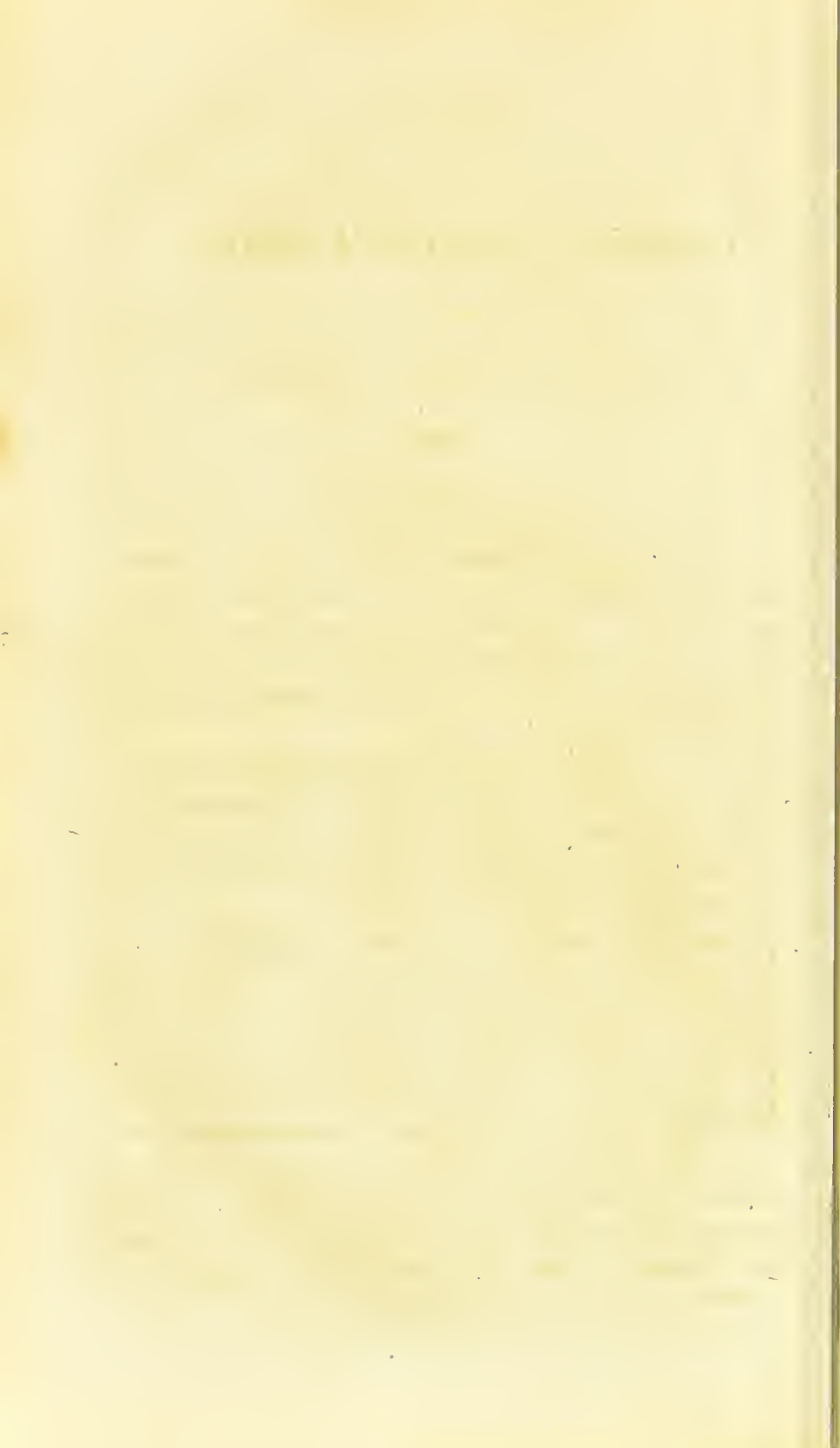


J. Shury. Sculp.

ANIMALS.







USEFUL KNOWLEDGE.

ANIMAL PRODUCTIONS.

INTRODUCTION.

1. ANIMALS are natural bodies which possess organization, life, sensation, and voluntary motion; and ZOOLOGY is that branch of natural science which treats of their systematic arrangement; their structure and functions; their habits of life, instincts, and uses to mankind.

2. The objects comprehended within the animal kingdom are divided into six classes: of Mammalia or Mammiferous Animals, Birds, Amphibia or Amphibious Animals, Fishes, Insects, and Worms: which are thus distinguished:

CLASSES.		
Body	{ With vertebræ	{ Hot blood { Viviparous I. MAMMALIA.
		{ Cold red blood . . { Oviparous II. BIRDS.
{ Without vertebræ.	Cold white blood	{ With lungs . . . III. AMPHIBIA.
		{ With gills IV. FISHES.
		{ Have antennæ . V. INSECTS.
		{ Have tentacula. VI. WORMS.

3. The first class, or MAMMALIA, consists of such animals as produce living offspring, and nourish their young ones with milk supplied from their own bodies; and it comprises both the quadrupeds and whales.

4. This class has been distributed into seven ORDERS; of *primates*, *bruta*, *feræ*, *glires*, *pecora*, *belluæ*, and *cete*, or whales. The characteristics of these are founded, for the most part, on the number and arrangement of the teeth; and on the form and construction of the feet, or of those parts in the seals, manati, and whales; which supply the place of feet.

ORDERS OF MAMMALIA.

- I. PRIMATES Have the upper *front teeth* generally four in number, wedge-shaped, and parallel; and two *teats* situated on the breast, as the *apes* and *monkeys*.
- II. BRUTA. Have no *front teeth* in either jaw; and the *feet* armed with strong hoof-like nails, as the *elephant*.
- III. FERÆ. . Have in general six *front teeth* in each jaw; a single *canine tooth* on each side in both jaws; and the grinders with conic projections, as the *dogs* and *cats*.
- IV. GLIRES. Have in each jaw two long projecting *front teeth*, which stand close together; and no *canine teeth* in either jaw, as the *rats* and *mice*.
- V. PECORA. Have no *front teeth* in the upper jaw; six or eight in the lower jaw, situated at a considerable distance from the grinders; and the *feet* with hoofs, as the *cattle* and *sheep*.
- VI. BELLUÆ Have blunt wedge-shaped *front teeth* in both jaws; and the feet with hoofs, as the *horses*.
- VII. CETÆ. . Have *spiracles*, or breathing holes on the head; *fins* instead of fore-feet; and a *tail* flattened horizontally, instead of hind feet. This order consists of the *narwals*, *whales*, *cachalots*, and *dolphins*.

5. The second class, or BIRDS, comprises all such animals as have their bodies clad with *feathers*. Their

jaws are elongated, and covered externally with a horny substance called a bill or beak, which is divided into two parts called mandibles. Their *eyes* are furnished with a thin, whitish, and somewhat transparent membrane, that can at pleasure be drawn over the whole external surface like a curtain. Birds *respire* by air-vessels, which are extended through their body, and which, in the abdominal cavity, adhere to the under surface of the bones. Their organs of motion are two *wings* and two *legs*; and they are destitute of external ears, lips, and many other parts which are important to quadrupeds.

6. Linnæus has divided this class into six ORDERS.

ORDERS OF BIRDS.

1. Land Birds.

- I. **RAPACIOUS BIRDS** (*Accipitres*) Have the upper mandible hooked, and an angular projection on each side near the point, as the *eagles*, *hawks*, and *owls*.
- II. **PIES** (*Pica*) Have their bills sharp at the edge, somewhat compressed at the sides, and convex on the top, as the *crows*.
- III. **PASSERINE BIRDS** (*Passeres*) Have the bill conical and pointed, and the nostrils oval, open, and naked, as the *sparrow* and *linnet*.
- IV. **GALLINACEOUS BIRDS** (*Gallinæ*) Have the upper mandible arched, and covering the lower one at the edge, and the nostrils arched over with a cartilaginous membrane, as the *common poultry*.

2. Water Birds.

- V. **WADERS** (*Grallæ*) Have a roundish bill, a fleshy tongue, and the legs naked above the knees, as the *herons*, *plovers*, and *snipes*.
- VI. **SWIMMERS** (*Anseres*) Have their bills broad at the top, and covered with a soft skin; and the feet webbed, as the *ducks* and *geese*.

7. Under the third class, or AMPHIBIA, are arranged such animals as have a cold, and; generally, naked body, a lurid colour, and nauseous smell. They respire chiefly by lungs, but they have the power of suspending respiration for a long time. They are extremely tenacious of life, and can repair certain parts of their bodies which have been lost. They are also able to endure hunger, sometimes even for months, without injury.

The bodies of some of them, as the turtles and tortoises, are protected by a hard and horny shield or covering; those of others are clad with scales, as the serpents, and some of the lizards; whilst others, as the frogs, toads, and most of the water-lizards, are entirely naked, or have their skin covered with warts. Many of the species shed their skins at certain times of the year. Several of them are furnished with a poison, which they eject into wounds that are made by their teeth.

They chiefly live in retired, watery, and morassy places, and, for the most part, feed on other animals; though some of them eat water plants, and many feed on garbage and filth. None of these species chew their food; they swallow it whole, and digest it very slowly.

The offspring of all the tribes are produced from eggs, which, after they have been deposited by the parent animals in a proper place, are hatched by the heat of the sun. The eggs of some of the species are covered with a shell: those of others have a soft and tough skin or covering, not much unlike wet parchment: and the eggs of several are perfectly gelatinous. In those few that produce their offspring alive, as the

vipers, and some other serpents, the eggs are regularly formed, but are hatched within the bodies of the females.

8. This class is divided into two ORDERS.

ORDERS OF AMPHIBIA.

- | |
|--|
| <p>I. REPTILES.. Have four legs, and walk with a crawling pace, as the <i>tortoises</i>, <i>frogs</i>; and <i>lizards</i>.</p> <p>II. SERPENTS Have no legs, but crawl on their belly.</p> |
|--|

9. FISHES constitute the fifth class of animals. They are all inhabitants of the water, in which they move by certain organs called *fins*. These, when situated on the back, are called *dorsal fins*; when on the sides, behind the gills, they have the name of *pectoral fins*; when on the belly near the head, they are *ventral*; when behind the vent, they are *anal*; and that at the posterior extremity of the body is called the *caudal fin*. Fishes breathe by *gills*, which, in most of the species, are situated at the sides of the head. In some of the flat-fish, however, as the skate and thornback, they are on the under part of the body. Fish rise and sink in the water, generally by a kind of bladder in the interior of their body, called an *air-bladder*. Some of them, as the skate and other flat-fish, do not possess this organ, and consequently are seldom found but at the bottom of the water. The bodies of these animals are usually covered with *scales*, which keep them from injury by the pressure of the water. Several of them are enveloped with a fat and oily substance to preserve their bodies from putrefaction, and also to guard them from extreme cold.

10. The fishes are divided into six ORDERS.

ORDERS OF FISHES.

- I. APODAL Have bony gills; and no ventral fins, as the *eel*.
- II. JUGULAR Have bony gills; and the ventral fins situated in front of the pectoral fins, as the *cod*, *haddock*, and *whiting*.
- III. THORACIC Have bony gills; and the ventral fins situated directly under the pectoral fins, as the *perch* and *mackerel*.
- IV. ABDOMINAL Have bony gills; and the ventral fins on the belly behind the pectoral fins, as the *salmon*, *herrings*, and *carp*.
- V. BRANCHIOSTEGOUS.. Have their gills destitute of bony rays.
- VI. CHONDROPTERYGEOUS Have cartilaginous fins, as the *sturgeons*, *sharks*, and *skate*.

11. The fifth class of animals comprises the INSECTS. These are so denominated from the greater number of them having a separation in the middle of their bodies, by which they are, as it were, cut into two parts. The science which treats of them is called ENTOMOLOGY.

Insects have, in general, six or more *legs*, which are, for the most part, nearly of equal length and thickness. Sometimes, however (as in the mole-cricket), the fore-legs are very thick and strong, for burrowing into the ground; sometimes the hind thighs are long and thick, for leaping; or flattened, fringed with hairs, and situated nearly in an horizontal position, to serve as oars for swimming.

Most of the insect tribes are furnished with *wings*. Some, as the beetles, have two membranous wings, covered and protected by hard and crustaceous cases,

called elytra; some, as the wasps and bees, have four wings without elytra; others, as the common house-flies, have two wings; and others, as the spiders, are entirely destitute of these members.

They are furnished with *antennæ*, which are usually jointed, and moveable organs, formed of a horny substance, and situated on the front and upper part of the head. These serve as instruments of touch, or of some sense which is to us unknown. The *eyes* of insects are formed of a transparent substance, so hard as to require no coverings to protect them. Their *mouth* is generally situated somewhat beneath the front part of the head, and in a few of the tribes is below the breast; and the jaws are transverse, and move in lateral directions. These are furnished with feelers, and other organs, of various arrangement and structure, which constitute the foundation of arrangement in some of the systems of entomology. All insects breathe, not through their mouth, but through pores or holes along the sides of their bodies; or, as in the crabs and lobsters, by means of gills. The skin of insects is, in general, of hard or bony consistence, divided into plates or joints which admit of some degree of motion, and is generally clad with very short hairs.

Nearly all insects go through certain great *changes* at different periods of their existence. From the *egg* is hatched the *larva*, grub, or caterpillar, which is destitute of wings; this afterwards changes to a *pupa*, or *crysalis*, wholly covered with a hard shell, or strong skin, from which the *perfect* or *winged insect*, bursts forth. Spiders, and some other wingless insects, issue from the egg nearly in a perfect state.

12. Linnæus has divided the animals of this class into seven ORDERS.

ORDERS OF INSECTS.

- I. **COLEOPTEROUS** Have elytra or crustaceous cases covering the wings; and which, when closed, form a longitudinal division along the middle of the back, as the *chafer*.
- II. **HEMIPTEROUS** Have four wings, the upper ones partly crustaceous, and partly membranous; not divided straight down the middle of the back, but crossed, or incumbent on each other, as the *cock-roach*.
- III. **LEPIDOPTEROUS** Have four wings covered with fine scales, almost like powder, as the *butterflies* and *moths*.
- IV. **NEUROPTEROUS** Have four membranous and semi-transparent wings, veined like net-work; and the tail without a sting, as the *dragon-fly* and *ephemera*.
- V. **HYMENOPTEROUS** Have four membranous and semi-transparent wings, veined like net-work; and the tail armed with a sting, as the *wasp* and *bee*.
- VI. **DIPTEROUS** . . . Have only two wings, as the *common house-flies*.
- VII. **APTEROUS** Have no wings, as the *spiders*.

13. The sixth and last class of animals consists of WORMS, or VERMES. These are slow of motion, and have soft and fleshy bodies. Some of them have hard internal parts, and others have crustaceous coverings. In some of the species eyes and ears are very perceptible, whilst others appear to enjoy only the senses of taste and touch. Many have no distinct head, and most of them are destitute of feet. They are, in general, so tenacious of life, that parts which have been destroyed will be re-produced: These animals are

principally distinguished from those of the other classes by having tentacula, or feelers.

14. Some late writers have divided the worms into three or more distinct classes; but the Linnæan division is into five ORDERS.

ORDERS OF VERMES, OR WORMS.

- I. **INTESTINAL** Are simple and naked, without limbs; some of them live within other animals, as the *ascarides* and *tape-worms*; others in water, as the *leeches*; and a few in the earth, as the *earth-worm*.
- II. **MOLLUSCOUS** Are simple animals, without shell, and furnished with limbs, as the *cuttle-fish*, *medusæ*, *star-fish*, and *sea-urchins*.
- III. **TESTACEOUS** Are animals similar to the last, but covered with shells, as *oysters*, *cockles*, *snails*, and *limpets*.
- IV. **ZOOPHYTES** Are composite animals, and appear to hold a rank between animals and vegetables; though they are in fact true animals, and possess sensation and voluntary motion. In many instances a great number of them inhabit the same stone, but some are soft, naked, and separate. The *coral*, *sponge*, and *polypes*, are instances of this order.
- V. **ANIMALCULES** Are destitute of tentacula or feelers, and are generally so minute as to be invisible to the naked eye. They are chiefly found in different infusions of animal and vegetable substances.

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CLASSI.—MAMMIFEROUS ANIMALS.

ORDER I.—PRIMATES.

15. MAN.

THE only production of the human body which appears to be useful in a commercial view, is the hair.

Human hair, for the purpose of being made into wigs, and ornamental head-dresses, is imported into this country from the Continent, and chiefly from Germany. We also import hair from China, but the latter is generally of very dark colour. On the Continent this article is almost wholly collected by pedlars, who travel through the different countries, and carry trinkets and other articles for sale, and to exchange for it.

When, some years ago, long hair was much more fashionable than it is at present, great numbers of young women in Germany suffered their hair to grow, and had it cut, from time to time, as a source of emolument. The notion that long hair is frequently cut from the heads of persons after they are dead is totally unfounded, since the uncertainty of such supply would alone render it impracticable. The hair that is used for men's wigs is almost wholly children's hair, no other being in general considered sufficiently fine for this purpose.

The value of hair is from five to twelve shillings per ounce, according to the quality, length, or colour. Before it can be used it is well rubbed with dry sand, and afterwards boiled, to clean it. Such as is intended

for wigs, if it do not curl naturally, is twisted round small earthenware cylinders, put into a vessel with sand, and baked in an oven, until it acquire this property. The most scarce and valuable kind of hair is that of flaxen colour.

So great was formerly the demand for long hair, and so extravagant the price for which it was frequently sold, that a mode was invented of stretching it to nearly double its original length. This was effected by fastening the ends of the hair to the opposite sides of a vessel, placing a heavy weight across the middle, and applying heat underneath. As the heat softened the hair, the weight pressed it down, and extended it. But this project was found not to answer, as the hair lost all its quality, and could never be used but when mixed with other hair, and even then the fraud was discoverable by the stretched hair gradually shrinking nearly to its original length.

In lawyers' and judges' wigs horse-hair and goats'-hair are frequently used, to give stiffness and form to the different parts.

16. APES, BABOONS, and MONKEYS (*Simia*), are all animals of hot climates, none of them except the Barbary ape (*Simia inuus*) being ever found wild in Europe. They are distinguished by having four front teeth in each jaw, and all their feet formed like hands.

Linnaeus, although he has arranged these animals under one tribe, has characterised the apes by their entire want of tails; the baboons by having short tails; and the monkeys by having long ones. The tails of some of the monkeys, particularly those of South America, are so formed, that the animals are able to coil them round any object so firmly as to afford them a support in, apparently, the most perilous situations. Several of the monkeys have pouches within their cheeks, in which they collect their food previously to its being swallowed.

The chief, perhaps the only, use to which these animals are applied, is as food. The pigmy apes are caught by the Arabs, and fattened for this purpose, as we would fatten sheep. Whilst Dampier was on the coast of

America he frequently partook of this kind of food; and states that he never ate any thing more delicious. The native American tribes eat the flesh of almost all kinds of monkeys, preferring that, however, of the *four-fingered species* to any other. Oexmelin informs us that, while he was at Cape Gracias a Dios, in New Spain, the hunters regularly brought home, in the evening, such monkeys as they had killed in the course of the day; and that their flesh somewhat resembled that of a hare, and was of peculiarly sweet flavour. He observes, that he and his companions lived on these animals all the time they remained there.

Desmarchias, in his account of Cayenne, says that the flesh of the *howling monkeys*, which are peculiarly numerous in the woods of that country, is a white and very palatable food, not indeed so fat, but in general as good, as mutton. Both the negroes and the colonists of Surinam occasionally subsist on monkeys. Yet, however delicate this kind of food may be, it is extremely repugnant to the feelings of an European to partake of what, when skinned, has so much the form and general appearance of a human being as these animals.

The woods of nearly all hot climates abound in monkeys, the species of which are extremely numerous. They feed almost wholly on fruit, grain, roots, and other vegetable productions. It would be inconsistent with the plan of the present work to enter into any detail relative to their habits of life. We can only say, generally, that few animals are known to be more active, mischievous, and enterprising than these. They usually live in immense troops, and commit great depredations in cultivated grounds near the forests where they reside; some of them continuing on watch, to give alarm in case of danger, whilst others are engaged in pilfering and carrying off the plunder to their habitations.

17. The BATS. (*Vespertilio*) constitute a very singular tribe of quadrupeds, which have the toes of their fore-feet extremely long, and connected together by a very thin and

dark-coloured membrane, that extends round the hinder part of their body, and serves the place of wings, in enabling them to flit along the air in pursuit of food.

There are near thirty ascertained species of bats, six of which are occasionally found in England. Some of them are smaller than a mouse, but others are so large that their extended membranes measure betwixt three and four feet in width. The latter are found only in torrid climates.

As all the European bats feed wholly on insects, which they catch during their flight, there can be no doubt but, in this respect, they are extremely serviceable to mankind. They devour myriads of night-flying moths, the caterpillars of which would otherwise prove injurious to our gardens, orchards, and fields.

The larger kinds, such as the *vampyre* and *spectre bats*, the former of which are found in incredible numbers in the islands of the eastern seas, and the latter on the continent of South America, are not unfrequently used as food. At a particular season of the year, they become fat; and though, whilst alive, their smell is excessively rank and unpleasant, they are then said to be delicious eating, and, in flavour, somewhat to resemble rabbits. The inhabitants of New Caledonia weave their *hair* into various ornamental articles, and plait it, with the stalks and leaves of a kind of grass, into tassels for their clubs.

ORDER II.—BRUTA.

18. The *LONG* and *SHORT-TAILED MANIS* (*Manis tetradactyla*, and *pentadactyla*, Fig. 18) are very singular quadrupeds, with a long muzzle, small mouth destitute of teeth, and their body covered with scales. They are distinguished from each other by the former having a very long tail and four toes, and the latter a short tail and five toes.

These animals are natives of India, Africa, and China; and are from four to seven or eight feet in length. From the scales with which their bodies are clad, and the general shape of the tail, they might be mistaken, at first sight, for lizards. The under part of their bodies, however, is clad with hair, which is not the case in any species of lizard.

By the negroes of Africa both the species of manis are much sought for, and on account, chiefly, of their *flesh* as food. There is, however, some difficulty in procuring them, as they live in obscure places, in the midst of rocks, woods, and morasses. When discovered they are unable to escape by flight, and, in self-defence, roll themselves into a ball, and erect their scales; exposing an armed surface on every side, impenetrable by the teeth of dogs, but easily assailable by the spears of the negroes. In their habits these animals are gentle and innoxious, and subsist only on insects, of different kinds.

Their *scales*, which are sufficiently hard to strike fire when struck against flint, are applied to many useful purposes.

19. The *ARMADILLOS* (*Dasypus*, Fig. 19) are a tribe of quadrupeds, which have grinding teeth, but no canine nor front-teeth; their bodies are covered with a crustaceous shell.

There are ten species, all of which are inhabitants of Brazil and other parts of South America, and are from eight or ten inches to three feet in length. The species are distinguished from each other chiefly by the number of flexible bands which extend across their back.

Their *flesh* is a favourite food with the inhabitants of South America. Of their *shells* these people make baskets, boxes, and numerous ornamental articles, which they paint and adorn in various ways; and the shells, reduced to powder, are sometimes administered internally as a medicine.

It is customary to hunt armadillos with dogs that are trained for the purpose. They reside in burrows which they dig in the ground. Into these they endeavour to retreat when pursued: or, if at too great a distance, they attempt to dig new ones before they are overtaken. When in their holes, they are either smoked out, or are expelled by pouring in water. The moment they are seized they roll themselves together, and will not again extend unless placed near a hot fire.

These animals seldom appear abroad except during the night; and they are often caught in snares that are laid for them at the mouths of their dens.

20. *The RHINOCEROS.*—*There are two species of rhinoceros, one of which has one, and the other two horns, situated on the nose, and three hoofs on each foot.*

These are animals of large size and bulky form, and live in swamps, morasses, and forests, in wet situations, within the torrid regions. The SINGLE-HORNED RHINOCEROS (Rhinoceros unicornis, Fig. 1.) which is generally five or six feet in height, is found in Africa, in the central and southern parts of Asia, and in the islands of Sumatra and Ceylon. Its skin is blackish, naked, extremely thick, covered with a kind of warts, and disposed into large folds on different parts of the body. The TWO-HORNED RHINOCEROS (Rhinoceros bicornis) is a native of Africa, and has a thick and dark-coloured skin, but not arranged in folds like that of the preceding species.

The *skin* of the rhinoceros is an article in great demand in several countries of Asia and Africa. It is manufactured into the best and hardest leather that can be imagined; and targets or shields are made of it, that are proof against even the stroke of a scimitar. In this state the colour of the skin is variegated; and when polished it is nearly similar in appearance to tortoise-shell. The inhabitants of Surat make very elegant targets of these hides, which they stud with silver-headed nails. The Hottentots make *chanbols* or whips of them.

In Sumatra, Ceylon, and some parts of India, the *flesh* of the rhinoceros is an useful food. The *horns*, which are from twelve to fifteen inches in length, and three to six inches in diameter, are much esteemed amongst the Mahometans, not on account of any real utility, but from their being considered an antidote against poison. Good-sized horns, if purchased at three or four pounds sterling each, may be sold in the East Indies, with considerable profit, to the Arabian merchants. They are made into drinking cups; and

it is believed that if any thing poisonous be put into them, a fermentation will ensue, by which the poison may be discovered. This, however, is without foundation, as very satisfactory experiments have proved. By the Arabians the horns of the rhinoceros are frequently made into the hilts of swords; and they are sold at an enormous price for that purpose. They are also manufactured into snuff-boxes, which are considered preferable to such as are made of tortoise shell; and we are informed by Martial, that the Roman ladies of fashion used them in the baths, to hold their essence bottles and oils.

The savage tribes of southern Africa, and even the inhabitants of the Cape of Good Hope, set a high value on the dried *blood* of the rhinoceros, to which they ascribe great medicinal virtues. The *hoofs*, and even the *teeth*, are also used medicinally.

Respecting the rhinoceros it may not be improper to remark, that, although naturally of a quiet and inoffensive disposition, his strength is such, that few animals are able to contend with him; and that the thickness of his hide is so great, as in several parts to be impenetrable even by a musket ball. These animals feed entirely on vegetable food, but particularly on the leaves and tender branches of shrubs. Their horns are not fixed into the bone of the head, like those of other quadrupeds, but only into the skin. They appear loose whilst the animals are in a quiescent state; but when the animals are irritated, they become fixed and immoveable.

21. The *ELEPHANT* (*Elephas*, Fig. 20), the only known animal of the tribe to which it belongs, is an inhabitant of the warmer regions of Asia and Africa, and is distinguished by having two long tusks projecting from the upper jaw, and the snout lengthened into a long and flexible trunk.

The general height of the elephant is nine or ten feet. Its skin is of dingy brown colour, and nearly destitute of hair. The tusks are much longer in the male than the female.

Each of the feet has five rounded hoofs: and the tail, which is short, is terminated by a few scattered, and very thick black hairs.

Throughout the whole of the East Indies, as well as in several other parts of Asia, the elephant is an animal of indispensable utility. When tamed and reduced to a state of submission, he becomes so tractable as to obey all the orders of his keeper. Elephants are formed in a particular manner for the service of man in hot climates. They are employed both as beasts of draft and burthen; and one elephant is supposed equal to as much work as six horses. They are conducted by a man, who sits on their neck, and who employs as a weapon an iron rod, hooked at the end, with which he pricks the animal to urge him forward, or turn him in any direction that may be required. Almost all the articles that are transported from place to place in India are conveyed by elephants. They bend their knees to accommodate those who mount them: and, with their trunks, they even assist the persons by whom they are loaded. Before the invention of gunpowder, elephants were much employed by the Indians in their wars. They are now chiefly used for the purposes of labour and parade. They require much attention, and are generally fed with rice, either raw or boiled, and mixed with water, of which each elephant will devour daily near a hundred pounds' weight, besides a certain quantity of fresh herbage which is procured for him. They are led to the water thrice a day, both to drink and bathe; and their daily consumption of water for drink has been estimated at forty five gallons each.

The modes in which elephants are caught and domesticated are curious and interesting. In a wild state they inhabit, in large troops, the thick and boundless forests of Asia and Africa. To obtain the single male elephants, it is customary, in some parts of India, to employ females, which are trained for that particular purpose. When the hunters have discovered a male elephant that suits them, they conduct four of the

females silently and slowly, at a little distance from each other, nearly to the place where he is feeding. If, as frequently is the case, he permit their approach, two of them are conducted, one on each side, close to his neck; a third places herself across his tail, and the fourth is brought up by proper attendants, who immediately pass under the animal and tie his legs with ropes. After this he is further secured; and, at length, though not without much difficulty, is conveyed home and domesticated.

When a herd of elephants are to be secured, a party consisting sometimes of 500 persons are employed. These, by fire and noises, drive them into certain enclosures, formed for the purpose; an operation which generally occupies several days. These enclosures are three in number, and communicate with each other by narrow openings or gateways. The opening of the outer enclosure is disguised, as much as possible, by bamboos and branches of trees stuck into the ground, so as to make it look like a natural jungle. It is not without much difficulty that the leader can be induced to enter: but, after he has passed, all the others immediately follow. There is still greater difficulty in inducing them to pass into the second and third enclosures: and lastly, one by one, into the roomee, an outlet about sixty feet in length, and so narrow that the animals are unable to turn round in it. Here, after in vain exerting all their powers to break down the fences and escape, they are all, in succession, secured by ropes that are fastened round their legs.

To domesticate the animals, they are now each placed under a keeper, who is appointed to attend and instruct them. After the elephant has for some days been supplied with food and water, the keeper ventures to approach him. He strokes and pats him with his hand, at the same time speaking to him in a soothing voice; and after a little while the beast begins to know and obey him. By degrees the keeper becomes familiar; he ventures to mount upon his back from

one of the tame elephants, and at length seats himself on his neck, from whence he afterwards regulates and directs all his motions. In a few weeks the animal becomes obedient; his fetters are by degrees taken off; and, in the course of six months, he submits entirely to his keeper's will.

Wild male elephants are frequently hunted and killed, both in Asia and Africa, on account of their tusks, which, under the name of *ivory*, are a very important article of traffic. The temptation held out, at the Cape of Good Hope, to this dangerous pursuit, in which many of the hunters lose their lives, is the payment of a guilder per pound for the tusks; and these weigh from 30 to 130 pounds each. For the whitest, smoothest, and most compact ivory that is known, we are, however, indebted to the island of Ceylon. The whole quantity of ivory exported from the Cape of Good Hope in four years, ending in 1804, amounted to 5981 pounds; and the average annual quantity vendid at the East India Company's sales from 1804 to 1808 was twenty-six tons.

The principal consumption of ivory is for making ornamental utensils, mathematical instruments, boxes, combs, dice, and an infinite variety of toys. This substance is also used for painting miniatures upon, for which, however, it goes through a peculiar preparation. It is capable of being stained of various and very beautiful colours. The shavings of ivory, like those of hartshorn, may, by boiling, be converted into a jelly; and they possess similar virtues. Bone is frequently substituted for ivory, but it is easily known by its pores, which are not to be seen in ivory, and by its wanting the beautiful white veins or marks by which ivory is distinguished.

The *flesh* of the elephant is eaten by the negroes of Africa; and the ancients attributed many medicinal qualities to the *blood* and the *trunk*.

22. The GREAT MORSE, or ARCTIC WALRUS (*Trichechus rosmarus*), is a marine quadruped of enormous

size, with short fin-like feet, two great tusks pointing downward from the upper jaw, the lips peculiarly thick, the upper lip cleft into two large rounded lobes, and no front teeth in either jaw.

These animals inhabit the sea near the northern parts of the coast of America, and feed on sea-weeds, corallines, and shell-fish. They are sometimes nearly eighteen feet in length, and ten or twelve in circumference. Their skin is of dark colour, and thinly covered with short brownish hair. They have small eyes, and small circular orifices in place of external ears.

We are informed that these animals, under the name of horse-whales, were objects of pursuit so early as even the reign of King Alfred, and on account chiefly of their *tusks* and *oil*. The former are a close-grained kind of ivory, and weigh from ten to near thirty pounds each; and the latter, which is equally valuable with that of whale oil, is in such abundance that the body of each animal yields nearly half a tun. This oil is burned in lamps, is used for the same purposes as whale-oil, and even eaten by the inhabitants of Greenland with their food. Of the *skins* of the arctic walrus the Greenlanders make a thick and strong harness for their sledges and carriages; and they sometimes twist narrow strips of them together to form cables. They constitute an important article of export from the coast of Labrador. The *tendons* of these animals are capable of being split and used as thread.

So numerous were arctic walruses formerly in the northern seas, that we are informed of the English, in 1706, having killed, on Cherry Island (betwixt Norway and Greenland) near eight hundred of them in six hours; and that, in 1708, they killed nine hundred in seven hours. Of late years, however, their numbers are much decreased.

ORDER III.—FERÆ.

23. The COMMON SEAL (*Phoca vitulina*, Fig. 2) is a marine quadruped with a large and round head, no external

ears, the neck smooth, the body tapering gradually to the tail, the legs smooth, and all the feet webbed.

This animal is found on almost all the northern shores of Britain; and is generally from four to six feet in length. Its colour varies, being dusky, whitish, grey, black, or spotted.

Seals are eagerly pursued by the inhabitants of nearly all the northern countries of Europe. They are found in hollow rocks or caverns near the sea, and are killed with guns, clubs, or spears. The usual season for hunting them is during the months of October and November.

The *flesh* of seals is much esteemed by the Greenlanders; and their *skins* are extremely serviceable. These are converted into clothing; into coverings for beds, houses, and boats; and into thongs, and straps of every description. The Americans fill them with air, and make a kind of rafts of them. The *fat* yields a clear and much sweeter oil than that obtained from whales, and is used by the Greenlanders in their lamps, and frequently also with their food. The *fibres* of the tendons are said to be a stronger and better substance for sewing with than either thread or silk. Before the introduction of iron the *bones* of seals were used for the points of weapons both for chase and war. The *skins of the entrails* are employed instead of glass in windows; and, sewed together, are formed into shirts, and other under parts of dress.

When the long and coarse hair of the seal is pulled off, a fine, short, silky, and somewhat fawn-coloured down is left, which in this country is a fashionable *fur* for ornamenting ladies' dresses. This fur woven with silk is also manufactured into shawls, which are of extremely soft and delicate texture. Seal *skins*, when tanned and properly dressed, are converted into a valuable leather for shoes and other uses.

24. The LEONINE SEAL, or SEA LION (*Phoca jubata*) is a marine quadruped which inhabits the shores of Kamschatka and Greenland, is sixteen or eighteen feet

length, and is distinguished by the male having its neck covered with a mane.

The great quantity of oil which is yielded by these seals is the cause of their being pursued and killed, by the inhabitants of all countries on the shores of which they are found. The *skins* of the younger animals are made, in Greenland, into garments for women; and those of the old ones are used for beds. When the latter are freed from the hair, they are applied as coverings for boats and houses. They are also sometimes sewed together as bags to contain provision, and for other uses. The *skins of the intestines* are used for the same purposes as those of the common seal; and the *teeth* are adapted for the points of arrows and spears.

There are numerous other species of seals, all of which are in some respects useful to mankind, and chiefly for the purposes which have been above enumerated.

25. The *DOG* (*Canis familiaris*) is an animal characterized by Linnæus as having the tail recurved, and bent towards the left side of the body.

Dogs are found in a wild state in Africa and South America.

As an attached and faithful servant of man, the dog is equalled by no animal. Though destitute of the faculty of thought, he has all the ardour of sentiment. He is all zeal, warmth, and obedience; and, forgetful of injuries, he seeks only how he may gain the favour and affection of his master. During the night he guards the house, and, by the noise he makes, he gives notice of the approach of depredators. He also protects the property committed to his care, and secures it from being plundered. He directs the steps of the blind, and, in some instances, has even been instructed to pick up money, and put it into his master's hat. Being endowed with great strength and fleetness of foot, some kinds of dogs are trained to the chase, and

taught not only to pursue and to destroy noxious and savage beasts, but also to hunt for and secure animals as food for their master. And there are many countries, both of the old and new Continent, in which, if man were deprived of this faithful ally, he would unsuccessfully resist the foes that surround him, and that are incessantly on the watch to destroy his labour, attack his person, or encroach upon his property.

But it is not only during his life that the dog is serviceable to mankind. After death his *skin* is converted, by the inhabitants of Greenland, into garments, and particularly into stockings. It is also used for the coverlets of beds. Dogs' skins in our own country are tanned, and applied to several useful purposes, as leather, and particularly for gloves and shoes. The *hair* of some kinds of dogs is so thick and matted that, like wool, it is capable of being converted into cloth. A small kind of King Charles's dog is mentioned by Dr. Anderson to have had long and soft hair, covering a finer sort, which might, with advantage, have been woven into shawls. He speaks of another kind which had a very thick fleece, much resembling that of some of the Lincolnshire sheep; and of a third kind with close frizzed wool, which was shorn annually and made into stockings. He, however, remarks that the finest hair he ever saw upon a dog, and which indeed for softness and gloss more resembled silk than hair, grew upon a very small kind of Maltese dog. This, if manufactured, might have been converted into shawls of uncommon softness and beauty. The fleece of a water dog, belonging to a farrier in the horse artillery, was manufactured into hats, and answered this purpose sufficiently well. Each fleece was sufficient for two hats, and was considered to be worth about twelve shillings.

Disgusting as it may appear to us, the *flesh* of the dog is a favourite food in many countries. The Greenlanders eat it with avidity. In the markets of Canton, dogs are exposed for sale in the same manner as other animal food. The negroes of Africa prefer their flesh

to that of any other quadrupeds; for dogs are sold in some of their markets at as dear a rate as mutton or venison. With the North American Indians they are considered a great delicacy; and we are informed by Pliny, that the Romans were so partial to this kind of food, that a fricassee of sucking puppies was considered a favourite dish with even the most notorious Roman epicures.

There are near thirty distinct and well ascertained varieties of the dog; of which fourteen are considered to be natives of our own island.

26. *The SIBERIAN DOG is distinguished by having its ears erect, and the hair of its body and tail very long.*

To the inhabitants of many northern countries of the world, these dogs are of essential service. They are employed in drawing sledges over the frozen snow, five of them being yoked to each sledge, two and two, with the fifth in front as a leader. These sledges generally carry only one person each, who sits sideways, and guides the animals by reins fastened to their collars; but more particularly by his voice, and a crooked stick which he carries in his hand. If the dogs be well trained, the charioteer has only to strike the ice with his stick to make them go to the left, and the sledge to make them go to the right; and, when he wishes them to stop, he places it betwixt the front of the sledge and the snow. When they are inattentive to their duty, he chastises them by throwing his stick at them; but great dexterity is generally requisite in picking it up again. So much, however, depends upon the excellence of the leader, that a steady and docile dog for this purpose is not unfrequently sold for as much as ten pounds sterling.

The fleetness of the Siberian dogs is so great that they have been known to perform a journey of 270 miles in three days and a half; and with a sledge containing three persons and their luggage, they will travel sixty miles in a day. During the most severe storms,

when their master cannot see his path, nor can even keep his eyes open, they seldom miss their way. And it is said that, in the midst of a long journey, when it is found absolutely impossible to proceed any further, the dogs, lying round their master, will keep him warm, and prevent him from perishing by the cold.

The natives of Kamtschatka wear the *skins* of these animals as clothing, and consider the long hair as an ornament.

27. *The NEWFOUNDLAND DOG*, for united size, strength, and docility, exceeds all the kinds of dog with which we are acquainted. As its name imports, it is a native of the island of Newfoundland; and also of the adjacent parts of America, where it is employed in drawing wood on sledges, from the interior of the country to the sea-coast. Four of these dogs are harnessed to each sledge, and are able with ease to draw three hundred weight of wood for several miles. And it is peculiarly deserving of remark, that they often perform this service without any driver. Before the introduction of horses into general use in Canada, most of the land-carriage was performed by dogs.

The ease with which the Newfoundland dog swims, and the strong attachment which he forms towards mankind, have rendered him of great service in cases of danger from the oversetting of boats, and other accidents by water.

BRITISH DOGS.

28. *The SHEPHERD'S DOG* is an animal of rude and inelegant appearance, has its ears erect or half erect, and the tail covered beneath with long hair.

In wide and extensive tracts of down or mountain that are appropriated to the feeding of sheep, it would be impossible for the shepherds to have any command over their flocks, without the assistance of this faithful and docile ally. At a word from his master he drives the sheep to and from their pasture, and will suffer no

stranger from another flock to intrude upon his. If he observe any of the sheep attempting to stray, he springs forward in an instant to stop their course, however great the distance. These dogs drive the sheep entirely by their voice; never lacerating them, nor indeed ever employing force but for the preservation of peace and good order. When awake they are, at all times, alive to their master's directions; and, in repose, they lie down by his wallet, and defend it from plunder.

29. *The WATER DOG is principally distinguished by having its hair long and curled, like the fleece of a sheep, its muzzle somewhat short, and the feet more webbed than those of most other dogs.*

There are two kinds of water-dogs, which differ only in size, the one being nearly as large again as the other.

It is to sportsmen principally that these dogs are of use. Being fond of swimming, they are chiefly employed for fetching out of the water game that has been shot and fallen into it.

Their *fleece* has so near a resemblance to wool, that it is capable of being manufactured into a coarse kind of cloth, or of being made into hats.

30. *The SPANIEL (Fig. 21) is a dog with pendulous and woolly ears, the hair long on all parts of the body, but particularly on the breast, beneath the body, and at the back of the legs.*

Like the water dog, the spaniel is chiefly useful to sportsmen, in the shooting of water fowl. And when hawking was a fashionable recreation in England, this was the kind of dog which was always taken out to spring the game.

In all ages the spaniel has been noted for fidelity and attachment to mankind; and the instances that have been recorded of these are innumerable. The chief order of Denmark (now improperly denominated the order of the elephant) was instituted in memory of a spaniel, which had shown a peculiar attachment

to the monarch, his master, when deserted by his subjects.

31. *The SETTER is a dog nearly allied to the spaniel, and is to this day frequently distinguished by the name of the English spaniel.*

In some parts of England these dogs are used in the field to discover and point out game to the sportsman. They are very tractable, and easily trained to their duty. And such are their muscular powers, that an instance has been related of a setter having hunted all the fields adjoining to the road along which his master was riding, through a distance of near sixty miles.

32. *The POINTER is a dog with smooth hair, stout limbs, blunt muzzle, and tail appearing as if in part cut off.*

These dogs are in common use with sportsmen, for discovering game, which they are taught to do with wonderful steadiness and attention. Aided by the acuteness of their smell, they gently approach the spot where the game lies, and at length stop; having their eyes steadily fixed upon it, one foot generally somewhat raised from the ground, and the tail extended in a straight line. If the birds run, the dog steals cautiously after them, keeping still the same attitude; and when they stop he is again steady. It is by the assistance of pointers that game is chiefly killed in this country.

33. *HOUNDS are distinguished into three kinds, called the harrier, fox-hound, and stag-hound; all of which are characterized by having their ears smooth and pendulous, and having on each hind foot a spurious claw, called a dew claw.*

Of these animals the first, which is the smallest, has its name from being employed in hunting the hare; the second is larger and more stout, and is used for hunting the fox; and the third, which is the largest, stoutest, and fleetest of the whole, is used for hunting the stag.

They are always taken to the field in packs, con-

sisting of about twenty-five couple; and, when in scent of their game, they unite in a loud yelling noise which they continue so long as they are in pursuit.

34. *The BLOOD-HOUND is larger than the common hound, and is generally of a deep tan or reddish colour, with a black spot over each eye.*

In the early periods of our history, blood-hounds were in much greater request than at present.—They are indebted, for their name, to the faculty with which they are endowed, of being able to trace wounded animals by their blood. Their principal employment was to recover such game as, after having been wounded, had escaped from the hunters. In most of the royal forests blood-hounds are at this day kept, for tracing wounded deer; which they are able to do, however distant the flight, or however thick the parts of the forest through which they may have passed. Deer-stealers are also frequently discovered by means of these animals.

Blood-hounds were formerly used in certain districts on the confines of England and Scotland, to overawe or pursue the depredators of flocks and herds. Of late years they have been employed in the island of Jamaica, to discover the ambuscades of the Maroons, in their projected descent upon the whites; and, in the Spanish West Indian islands, to traverse the country, in pursuit of persons guilty of murder and other crimes. The dogs are taught to act more by exciting terror than by attack; and criminals are in general taken by them, and brought to justice, without the slightest personal injury.

35. *The GREY-HOUND (Fig. 22) is distinguished by his slender and curved body, his narrow muzzle, and his tail being curved upward at the extremity.*

Our ancestors so highly esteemed the grey-hound, that, by the laws of Canute, it was enacted that no person under the degree of a gentleman should presume to keep a grey-hound. The pursuit of animals

by these dogs is particularly denominated *coursing*. Those that were anciently coursed by them were the deer, the fox, and the hare; but they are now only used for coursing the hare. They hunt by sight, and not by scent; and their fleetness of foot is such that, in a hilly or uneven country, there are few horses which can keep pace with them.

36. *The MASTIFF (Fig. 23) is a dog of large size and robust body; and has the lips hanging down at the sides.*

By the ancient Britons it was customary to train these dogs to be of use in war. With us they are chiefly employed as watch dogs; and they discharge this duty in many instances with great fidelity. Some of them will suffer a stranger to come into the enclosure they are appointed to guard, and will accompany him peaceably through every part, so long as he continues to touch nothing; but the moment he attempts to lay hold of any of the goods, or endeavours to leave the place, the animal informs him, first by growling, or if that be ineffectual, by harsher means, that he must neither do mischief nor go away. He seldom uses violence unless resisted; and in this case, will sometimes seize the person, throw him down, and, without biting him, will hold him there for hours, or until relieved.

When roused to fury the mastiff is one of the most tremendous animals with which we are acquainted, and consequently one of the most difficult to be overcome in combat. He is, however, capable of a steady attachment towards his master, and will protect him from injury at the risk of his own life.

37. *The BULL-DOG is smaller than the mastiff, but in general form is nearly allied to it: the body is robust, the snout somewhat flatter than that of the mastiff; and the lips are pendulous at the sides.*

For courage and ferocity the bull-dog is exceeded by no British animal of its size. Since the horrid practice

of bull-baiting has been discontinued in this kingdom, the race of these dogs has much declined ; and the few that are now seen are employed by butchers and other persons as watch-dogs.

38. *The TERRIER is a small and hardy kind of dog, the name of which is derived from its usually subterraneous employments.*

Some terriers are rough, and others smooth haired. They are generally of reddish brown, or black colour, short-legged, and strongly bristled about the muzzle.

These dogs, the determined enemies of almost every species of vermin, are of great use to farmers and others, in the extermination of rats, polecats, and similar depredators. They are also employed in driving foxes from their dens, and on this account are generally attendants upon every pack of fox-hounds. Formerly they were used in rabbit warrens, to expel these animals from their burrows. In character they are fierce, keen, and hardy ; and, being remarkable for vigilance, they are admirable house-dogs.

39. *The LURCHER is a dog apparently partaking of the nature both of the terrier and the grey-hound ; there are two varieties, one covered with short and thickset hair, and the other with long and harsh hair.*

As this dog hunts both by sight and smell, and takes his prey without noise, he is frequently employed by poachers in their nocturnal excursions in pursuit of game. When in the midst of game the lurcher does not, like most other dogs, either bark or suddenly run upon it ; but, by a seeming neglect, he deceives the object till it comes within reach, and then suddenly springs upon and secures it.

40. *The TURNSPIT is a small dog, with short and generally crooked legs, and the tail curled upward.*

These dogs were formerly much employed to assist in the roasting of meat. For this purpose they were placed in a broad kind of wheel connected with the spit, which they turned round by running in it as

a squirrel does in his cage. They are still used in this capacity in most of the countries of the Continent; but being now in little request in England, the breed is nearly extinct with us.

41. *The WOLF* (*Canis lupus*) is a ferocious animal of the dog tribe, of brownish colour, with pointed nose, erect and sharp ears, and bushy tail bent inward.

This animal is found wild in most of the countries of the Continent, and was formerly common in England.

The wolf affords to us nothing valuable but his *skin*, which makes a warm and durable fur.

In North Carolina there is a kind of wolf the *skin* of which, when properly dressed, makes good parchment; and, when tanned, is convertible into excellent summer shoes. The Indians frequently use these skins for beds, under an impression that they drive away bugs and fleas; and they imagine that nearly all parts of this animal are useful as remedies for different bodily disorders.

In the ancient periods of our history wolves were so numerous and so destructive in England, that we are informed of places having been built in different parts of the island to defend passengers from their attacks. In the reign of Edward the First, a royal mandate was issued to a person whose name was Corbet, to superintend and assist in the destruction of wolves, in the several counties of Gloucester, Worcester, Hereford, Salop, and Stafford; and numerous individuals held lands of the crown, by the duty of hunting and destroying wolves. The latest account that has occurred respecting the existence of wolves in England is under the date of 1281. The last wolf known to have been killed in Scotland was in the year 1680; and the date of the complete extinction of these animals in Ireland is 1710.

42. *The COMMON FOX* (*Canis vulpes*, Fig. 24) is an animal of the dog tribe, of brown colour, with sharp muzzle, erect and pointed ears, and straight and bushy tail tipped with white.

This animal is found in almost every country of the world.

Although foxes occasionally commit great depredation in poultry-yards, and among game, they are serviceable to mankind by destroying many kinds of noxious animals. Their *skin* also constitutes a soft and warm fur, which, in many parts of Europe, is used for muffs and tippets, for the linings of winter garments, and for robes of state. So great is the demand for these skins, that, at Lausanne, there are furriers, who in a single winter, have received betwixt two and three thousand of them from different parts of the adjacent country. The *flesh* of the fox is eaten by the inhabitants of some countries of the Continent.

43. The ARCTIC FOX (*Canis lagopus*) is an animal of the dog tribe, smaller than the common fox, of white or bluish grey colour; the hair very thick, long, and soft, the tail straight and bushy, and the feet very hairy.

The extreme parts of North America, and the country around the Frozen Sea, are those which the Arctic fox principally inhabits.

These animals are principally killed on account of their *skins*, their fur being light and warm, though not durable. In winter this changes to a white colour, and becomes much thicker. The inhabitants of Greenland split the *tendons*, and use them as thread; they also sometimes eat the *flesh* of these animals.

The modes in which they are caught are various: by stone traps; in holes in the snow, the openings to which are surrounded by snares; in pitfalls, the surfaces of which are so covered that the animals are unable to discover them; and with arrows and guns.

44. The LION is an animal of the cat tribe, distinguished, from all others, by his body being of uniform tawny colour, the tail being long and bushy at the end, and the neck and chest of the male being clad with a shaggy mane.

The deserts of the interior of Africa, Persia, India, and Japan, are inhabited by these animals.

The *skin* of the lion was formerly used as the tunic

of heroes. At this day it serves both as a mantle and a bed for many of the African tribes. His *flesh*, though of strong and disagreeable flavour, is occasionally eaten by the savages, who do not dislike it the more on that account. The *fat* of the lion is considered to possess many medicinal properties.

It is a characteristic of the lion that he does not often attack any animal openly, unless provoked, or impelled by hunger. The immense strength of his body, his dauntless courage, and the great quantity of food that is requisite to his support, all, however, tend to render him an object of dread. His voice, when irritated, is an horrible roar, which is particularly loud and tremendous when in the act of springing upon and seizing his prey. The only mode of alarming these animals, and preventing a threatened attack, is by fire; the notion of their being alarmed at the crowing of a cock is entirely fabulous.

45. The TIGER (*Felis tigris*) is an animal of the cat kind, about the size of a lion, with smooth hair, of brownish or tawny yellow colour, and marked by long transverse stripes.

He is a native of various parts, both of Asia and Africa, but is principally found in India and the Indian Islands.

The *skin* of the tiger is almost the only advantage, trifling as that is, which mankind appears to derive from this destructive beast. Tigers' skins are occasionally imported into Europe, but not in great numbers, as articles of trade. They are rather brought as objects of curiosity than of use; and are chiefly employed as hammer-cloths for carriages. They are, however, much esteemed by the Chinese; the mandarins cover their seats of justice and sedans with them, and also use them for cushions and pillows in the winter. The best skins are of large size, with bright yellow ground, beautifully marked with numerous broad black stripes; the more intense the yellow, and the better defined the stripes, the more valuable are the skins. The Indians eat the

Flesh of the tiger, which they find neither disagreeable nor unwholesome. They also attribute medicinal properties to various parts of the tiger's body.

The great military officers of China have the figure of a tiger embroidered on their robes, than which there could not be selected a more appropriate symbol of the evils and horrors of war.

We know of no quadruped so powerful and ferocious as this. He is the terror of the inhabitants of all the hotter parts of Asia, who not only fear for ravages which he commits amongst their cattle and flocks, but even for their own personal safety. The mode of seizing his prey is by concealing himself, and springing suddenly upon it with an hideous roar. This tremendous beast usually resides in woods and thickets, near streams or morasses.

46. *The PANTHER* (*Felis pardus*), *OUNCE* (*Felis uncia*), and *HUNTING LEOPARD* (*Felis jubata*), are all animals of the cat tribe; of which the panther is about seven feet in length, and has the upper part of the body marked with circular spots, many of them with a spot in the centre, and the lower parts with stripes; the ounce is about three feet and half in length, has the body whitish, with irregular black spots; and the hunting leopard is about the height of a grey-hound, has its body tawny, with black spots, and the neck somewhat maned.

Each of these animals is found in the hotter parts of Africa and Asia.

In Persia and India, the ounce and hunting leopard are each trained for the *chase* of antelopes and other game. Of these the former is carried, on horse-back, behind the rider, upon a small leather pad made for the purpose. As soon as the horseman perceives an antelope or other animal at a moderate distance, he makes the ounce descend; which, creeping unperceived near the spot, springs, at five or six amazing leaps, suddenly upon it, and seizes it securely by the neck. The hunting leopard is generally carried in a small waggon, chained and hooded, lest his precipitation should defeat

his master's purpose. His mode of approaching and seizing his prey is similar to that of the ounce.

The *skins* of all these animals are valuable, and are converted into excellent furs. That of the panther is particularly esteemed in Russia.

47. The *LEOPARD* (*Felis leopardus*) is an animal of the cat tribe, about four feet in length, of yellowish colour, and marked with numerous annular spots.

It is an inhabitant of Senegal, Guinea, and most parts of Africa; and has considerable resemblance, both in habit and appearance, to the panther.

Leopards' *skins* are much esteemed in Europe. They seldom exceed four feet in length; and should be chosen large, of lively yellow colour, marked on the back and sides with annular spots, the belly covered with longish white hairs, and with large and oblong spots on the tail. Their use is for hammer-cloths, muffs, the trimmings of ladies' dresses, and other purposes. Some of the most valuable of these skins sell for ten guineas each and upwards. The *flesh* of the leopard is said, by Kolben, to be white and of good flavour.

48. The *COMMON CAT* (*Felis catus*), in its wild state, is distinguished from all the animals of the same tribe by having its tail marked with rings of different coloured hair.

The body of the wild cat is marked with dusky stripes, of which three on the top of the back are lengthwise, whilst those on the sides are transverse and somewhat curved. Domestic cats are marked very variously; some are grey and striped, others variegated with black, white, and orange, and others are entirely black or white.

Cats are found wild in woods of Europe, Asia, and America.

The savage disposition and great size of the wild cats render them the most formidable wild animals which are now left in Great Britain. In the southern and midland parts of England they have all been long destroyed; but, in the woods which border the lakes of Westmoreland and Cumberland, and in several of the

mountainous parts of Scotland, they are yet occasionally found. They have their lodgments in hollow trees, in the fissures of the rocks, and in deep and narrow holes on the face of dreadful precipices; from which, during the night chiefly, they issue forth in search of prey. This consists of hares, rabbits, and other quadrupeds, and also of various kinds of birds. Wild cats are caught in traps, more for the purpose of destroying them on account of the ravages they commit, than for any uses to which they can be converted. Their *skins* were formerly in request as fur for the lining of robes and other garments; though they do not appear to have been held in much esteem.

The *domestic cat* (Fig. 3) is a subdued variety of the wild species; and although it still partakes, in some degree, of the native ferocity of its original, it is a clean and useful inmate in our houses. By the ancient Egyptians cats were considered objects of sacred veneration; it was accounted a capital crime wilfully to kill one of them, and whoever even accidentally killed one was liable to severe punishment. We are informed by Herodotus, the Greek historian, that, whenever a cat died a natural death, the inhabitants of the house were accustomed to shave their eye-brows in token of sorrow, and the animal so dying was embalmed and nobly interred. The Turks entertain a sacred respect for cats; and the ancient Britons so greatly esteemed them that, in the tenth century, their price was inserted even in the laws of the land: a kitten, before it could see, having been rated at a penny (equal to at least five shillings of present money); as soon as proof could be had of its having caught a mouse, the price was raised to two-pence; and a tolerably good mouser was considered worth four-pence.

These animals possess a very acute sense both of sight and smell; and by the peculiar structure of their eyes, which sparkle in the dark, they are able to discover their prey, such as rats and mice, as well in the night as during the day; and a cat, that is a good

mouser, will soon clear a house of these troublesome little quadrupeds. Cats should not, however, either be much handled or too well fed, if kept for this purpose; as, in this case, they become indolent and disinclined to exert themselves.

Useful as cats are to us, they are, in some respects, unpleasant. If injured or offended, they suddenly express their resentment by scratching and biting, and sometimes with great fury. Constantly bent on theft and rapine, they are never to be trusted in the same room with provisions that are within their reach; and although many persons do not hesitate to let them sleep on their beds, it is a practice much better avoided, as the exhalation from their bodies is considered to be injurious.

The *skins* of cats form, in some countries, a very considerable branch of commerce; and, as furs, they are much esteemed for particular purposes. Those of Spanish cats are the most valuable; but the greatest number is sent from the northern parts of Europe and Asia. The Russians not only export them to other countries of Europe, but even send them into China. In Jamaica, and some of the other West Indian islands, the negroes frequently eat the *flesh* of cats. From the skins of their intestines was formerly manufactured the article called *cat-gut*, which was used as strings for violins, and other similar musical instruments; but this is now chiefly made from the intestines of sheep. If the fur of the cat be rubbed with the hand, particularly in frosty weather, it yields electric sparks; and if a cat, clean and perfectly dry, be placed during frosty weather on a stool with glass feet, and rubbed, for a little while, in contact with a coated phial, the phial will become effectually charged. This fur is consequently sometimes used in electrical experiments.

The Caffre women, in the South of Africa, occasionally use cat-skins as pocket handkerchiefs.

49. *The LYNX (Felis lynx) is an animal of the cat tribe,*

about four feet in length, exclusive of the tail, which is obscurely ringed, and black at the tip; the head and body are whitish tawny, spotted with black; and the ears have a long pencil of black hair at the tip.

This animal is found in woods and forests of the northern parts of Europe, of Asia, and America, where it climbs with facility into the loftiest trees.

There is a trade in the skins of lynxes, and other animals, betwixt Russia and China. These skins constitute a thick and soft fur, and, when of pale or whitish colour, with the spots tolerably distinct, they are very valuable. The further north the animals are caught, the whiter and better are the skins; those that are most elegant are taken near lake Balkash in Usbec Tartary. They are sold at a rate of from fifteen shillings to five or six pounds sterling each, exclusive of the fore feet, which are so valuable as to be sold separately, and at high prices.

50. The ICHNEUMON (*Viverra ichneumon*) is a quadruped somewhat more than three feet in length, of which the tail, which is thick at the base, and tapering and tufted at the extremity, measures nearly half: the hair is hard, coarse, and of reddish gray colour, and the great toes are remote from the others.

It is found in Egypt, and particularly in the parts of that country which are adjacent to the banks of the Nile. It is also found throughout nearly all the southern parts of Asia.

To the inhabitants of Egypt the ichneumon is an animal of great importance. Being a natural enemy of the whole serpent race, and of other noxious reptiles which infest that country, it unsparingly attacks and destroys them. It combats, without dread, even the most venomous serpents; and the address with which it seizes them by the throat, in such manner as to avoid receiving any injury itself, is very remarkable. It digs the eggs of crocodiles out of the sand; and even kills and devours great numbers of the young ones of those tremendous and dreaded creatures. Both in India and

Egypt the ichneumon is domesticated and kept in houses, where it is found more serviceable than a cat; in destroying rats and mice. It is easily tamed, and very active, and springs with great agility on its prey. For its various services, but more especially in the destroying of crocodiles, it was ranked by the ancient Egyptians amongst their deities, and received the honours of divine worship.

51. *The STRIATED WEASEL, or SKUNK (Viverra putorius), is an animal of the ichneumon tribe, which has the upper parts of its body striped with black and white, the neck and legs very short, and the tail is clad towards its extremity with long whitish hair.*

This animal is about eighteen inches in length exclusive of the tail, which measures about fourteen inches. It is an inhabitant of several parts of America.

The mode in which the skunk is protected from the attack of enemies more powerful than itself, is by emitting an odour so fetid and abominable that few creatures are able long to continue within its influence. Cattle are said to be so much alarmed by it as to utter the most dreadful bellowings. Clothes that are infected with this smell retain it for many weeks: no washing can render them sweet, and they must be for some time buried in the fresh soil before they are thoroughly cleansed. Notwithstanding this, the American Indians frequently eat the *flesh* of the skunk; but great care is requisite in killing it, to prevent any ill effect which would arise from its noxious vapour. As soon as the animals are dead, the glands, from which this vapour issues, are cut away, and the flesh, then untainted, is said nearly to resemble that of a young pig. The *skins* of these quadrupeds, which are sweet, and well clad with hair, are much in request by furriers. The inhabitants of Chili are very partial to them as coverlids for their beds, and for other useful purposes. The Indians also make purses of them, which they hold in great esteem.

52. The *CIVET* (*Viverra civetta*) is an animal of the ichneumon tribe, distinguished by having coarse hair of yellowish ash-colour, marked with large blackish or dusky spots and stripes; a sort of upright mane on the neck and back, and the tail spotted above, and brown towards the tip.

The whole length of the civet is generally about two feet. It is a native of several parts both of Africa and India.

The drug or perfume called civet is the production of this animal. It is formed in a large bag or receptacle situated at a little distance beneath the tail, and the creature often spontaneously presses it out through an external orifice. This substance is a fatty secretion about the consistence of soft pomatum, of lively white colour when fresh, but darker when it has been some time kept. Its perfume is so strong, that it infects every part of the animal's body. The skin and hair are so entirely impregnated with it, that they retain their original smell long after they have been taken from the body; and if a person be shut up in the same apartment with one of these quadrupeds, the odour is almost insupportable.

Civet was formerly much employed in medicine; but it is now seldom used, except as a perfume. It communicates some smell both to watery and spirituous liquors; hence a small portion of it is often added to odoriferous waters and spirits. The Italians make it an ingredient in perfumed oils, and in this manner obtain the whole of its scent; for oils dissolve the entire substance of the civet. When genuine, its value is from thirty to fifty shillings per ounce.

Although the animals which produce this drug are inhabitants of hot climates, they are kept in great numbers, and with a commercial view, at Amsterdam. They are fed with boiled meat, eggs, birds, small quadrupeds, and fish; and, as soon as the receptacle of any of them is supposed to be nearly full, the animal is put into a long cage, so narrow that it is unable to turn round. This cage has a door behind, through which a small spoon or spatula is introduced into the pouch.

This is carefully scraped, and its contents are deposited in a proper vessel. The operation is usually performed twice or thrice a week.

In many parts of the Levant and the East Indies, civets are reared and fed, as domestic animals are with us: but as, in the Levant particularly, they are few in number, and brought from a great distance, the perfume is increased by introducing into the bag a small quantity of butter or other fat. The people then shake the animal violently, and, by beating, irritate and enrage it as much as possible. This accelerates the secretion; and the fat, after having imbibed a great portion of the perfume, is used in place of the genuine drug. Civet is adulterated by mixing it with storax and other balsamic and odoriferous substances. That which is procured from Amsterdam is said to be less adulterated, and consequently is held in higher estimation than the civet which is imported from the Levant and the East Indies; but, notwithstanding the apparent care to sell it genuine, as would appear by the sealed bottles in which it is purchased, there is reason to suppose that very little indeed of it is free from adulteration.

It must be remarked, that the drug called civet is not only produced by this animal, but by some others of the same tribe, though in smaller quantity, and of less value. Civet is more pleasant than musk (65), to which it has some resemblance, and with which, by ignorant persons, it is sometimes confounded.

53. *The GENÈT (Viverra genetta) is a quadruped belonging to the ichneumon tribe, and nearly allied to the civet, but is distinguished by its tail having seven or eight black rings, and the body being of tawny red colour, spotted with black.*

It is an inhabitant of some parts of Asia, and is also found in France and Spain. Its length is about seventeen inches.

Like the civet (52) this animal produces, and in similar manner, an agreeable perfume. It is not, how-

ever, so powerful as that of the civet, and its scent much sooner evaporates. The *skin* of the genet is capable of being made into a light and handsome fur. This was formerly a fashionable substance for muffs, particularly on the Continent; and, as the animals are by no means numerous, was sold at high prices. After a while, however, the art of counterfeiting it, by staining the skins of grey rabbits with black spots, having been discovered, its value gradually abated, and, at length, it has ceased to be in request.

54. The *MARTIN* (*Mustela foina*) is a quadruped belonging to the weasel tribe, with greatly lengthened body and short legs, and the body of blackish tawny colour above, brown on the belly, and white on the throat.

This animal is about eighteen inches in length, exclusive of the tail, and is not uncommon in woods near farm-yards, in the southern districts of Great Britain and Ireland. It is also found in several parts both of the Old and New Continent.

In some countries the martin is an object of eager pursuit, on account of its *skin*, which makes a valuable fur. This is in great request in Europe for lining and trimming the robes of magistrates, and for several other purposes. In Turkey, where furs of all kinds are in much esteem, those of the martin are particularly admired; and they are exported thither chiefly from France and Sicily. They form a considerable article of commerce betwixt this country and the northern parts of America; more than 12,000 skins being annually imported from Hudson's Bay, and more than 30,000 from Canada. The most valuable part of the skin is that which extends along the middle of the back. In England these skins are sold for about seven shillings each; and the best and darkest of them are sometimes imposed upon the purchaser for sables' skins (55). In some countries the flesh of the martin is eaten; but from its musky flavour, it is not very palatable even to persons who are accustomed to partake of it.

55. The *SABLE* (*Mustela zibellina*, Fig. 4) is an animal

of the weasel tribe, which in its general shape and size has a great resemblance to the martin (54), and is of a deep glossy brown colour.

It is a native of some of the northern parts of America and Europe, as well as of Siberia and Kamschatka, and is usually about eighteen inches in length.

The *fur* of the sable is peculiarly valuable. Some of the darkest and best skins, though not more than four inches in breadth, have been sold at sums equal to twelve or fifteen pounds sterling each. Sables' skins are chiefly imported from Russia, and the greatest number of them was formerly obtained in Siberia, by persons banished thither from Russia: or sent for the purpose of collecting them. These were compelled by the government to furnish annually a certain number of skins by way of tax.

Sables are chased only during the winter, betwixt the months of November and January; for at that time the skins are in the highest perfection. Such animals as are caught at any other season have their skins full of short hairs, which render them less valuable. The sable hunters frequently assemble in companies of thirty or forty, and proceed along the great rivers in boats, taking with them provisions for three or four months. They have a chief, who, when they are arrived at the place of their rendezvous, assigns to each division of his men the quarter to which they are to go. In the places which are frequented by these animals the hunters remove the snow, on particular spots, and place snares there, each hunter being able to place about twenty snares in a day. They also pitch upon small places near trees; these they surround with pointed stakes of a certain height, covering them with boards to prevent the snow from falling in, and leaving a narrow entrance, above which is placed a beam supported only by a small and light piece of wood. As soon as a sable touches this to seize the piece of meat or fish which is placed for a bait, the beam falls and kills it.

Sables are also caught by a kind of snares that are usually laid for grouse and hares, being peculiarly partial to the seeds that are employed as bait for these animals. Nets are sometimes used. When the hunter has discovered the trace of a sable in the snow, he pursues it till he arrives at the burrow of the animal, over the mouth of which he places his net, and then by smoke compels the animal to come out, when he is secured in the net. If fire-arms are used, they are loaded only with single balls, that the skins may be as little injured as possible. Sometimes, in place of fire-arms, cross-bows with very small or with blunt-headed arrows are adopted.

All the sables, as they are caught, are either delivered to the chief hunter, or concealed in holes of trees, lest the Tonguses, or other tribes inhabiting the adjacent country, should steal and carry them away. When the time appropriated to the chase is over, the hunters all assemble at the place of rendezvous, and return home.

The hardships, fatigue, and perils with which these expeditions are attended, may well be conceived when we consider the nature of the country, the season of the year, and the intense cold which the hunters have to endure. Frequently do they penetrate into the depths of immense and trackless woods, from which they have no other mode of securing a retreat, than by marking the trees as they advance; and, if these marks should be obliterated and fail them, they must inevitably be lost; often have they to sustain the extremes of cold and hunger. Some instances have been mentioned of sable hunters, when their provisions have failed, being reduced to the necessity of tying thin boards tight to their stomachs to prevent the cravings of appetite. To all these must be added the constant peril, under which they labour, of being overwhelmed and lost in the snow.

The fur of the sable is short, and generally of glossy and beautiful blackish brown colour: some animals,

however, are of lighter colour, some have yellowish spots on the neck, and others have been found entirely white; but the skins of these are of little further value than as curiosities.

There is a mode of dyeing the light-coloured furs darker, and also of dyeing other furs to imitate sables; but these are easily discovered by their having neither the smoothness nor the gloss of furs in a natural state.

Sables are very sprightly and active little animals. They form holes or burrows under ground in forests, and the banks of rivers, and subsist on small quadrupeds, birds, eggs, and other animal substances of different kinds.

56. *The FERRET (Mustela furo) is a species of weasel, which, in shape, somewhat resembles the martin (54); but it has a strong and more shaggy fur, of dingy yellowish colour, and red eyes.*

It is found wild in the northern parts of Africa.

The principal use to which this quadruped is applied is in rabbit warrens, for driving those animals out of their burrows into the nets or traps of the warreners. Though naturally of savage disposition, ferrets are easily tamed, and rendered sufficiently docile for all the services that are required of them. They should be kept in tubs or chests, and well supplied with clean straw, as otherwise they would become excessively fetid and offensive.

When about to be used, they should be kept, for a little while, without food, and have their mouths securely muzzled. The former, lest they should become indolent and not hunt: and the latter, lest they should satiate themselves on the rabbits, and consequently be disinclined to return from the burrows. Some warreners are so cruel as to sew up the mouths of ferrets instead of muzzling them.

When put into a burrow it is customary to tie a bell round the neck of the ferret, and purse-nets are fastened over all the holes that are supposed to communicate with that in which he is placed. The use of the bell is to ascertain the situation of the ferret, and

prevent his being lost. The best time for setting the nets is at day-break, and they are generally suffered to remain till half an hour before sun-rise: and they are set again from half an hour before sun-set until it is dark. If it be required to take half-grown rabbits from holes that are known to have few angles, and not to extend far below the surface of the ground, it is sometimes customary to use the ferret unmuzzled, and with a line round him; and as soon as he is supposed to have seized the rabbit, he is drawn gently back with the animal in his mouth.

Ferrets are frequently kept by farmers and other persons for killing rats; and so eager and active are they in this pursuit that few are able to escape them. Even a young ferret, after he has seized a rat, will so perseveringly retain his hold, as to suffer himself to be dragged to a considerable distance before he can kill it, but he seldom fails in doing this at last.

As the unmixed breed of ferrets is supposed to degenerate, and lose, in some degree, their native ferocity, it is usual with some warreners to cross the breed with our native wild animal the polecat.

57. *The ERMINE is a species of weasel, of white colour, except the tip of the tail, which is black. This is, however, only the winter colour of the animal in the northern parts of Europe; in the summer it becomes brown instead of white, and in this state has the name of stoat.*

This animal, which, in its brown state, is well known in all parts of England, is usually about ten inches in length, exclusive of the tail.

The skins of ermines are a valuable article of commerce in several parts of the Continent, and particularly betwixt the Russians and Chinese. In some countries, as in Norway, Lapland, and Finland, the animals are found in prodigious numbers. They are generally caught in traps, but are sometimes shot with blunt arrows. Their skins are employed for ornamenting robes of state, and in various parts of female dress; and, for these purposes, they have been used during

many centuries past, as is evident from ancient paintings, sculpture, and other authorities. The black tips of the tails are considered peculiarly valuable.

In Russia ermines' skins of good quality are sold at the rate of about a shilling each. They are usually sewed in lengths of three Russian ells, and these parcels are estimated, according to their quality, at from two to five guineas each. Many deceptions, however, have been practised respecting ermines' skins, which have tended to depreciate their value; the principal of these is to conceal and sew small bits of lead in the feet, to increase their weight.

Ermines, like all other animals of the same tribe, are carnivorous, and very destructive to such quadrupeds as they are able either openly to attack, or to seize by stratagem. They are chiefly found amongst woods, in hedge-banks, hollow trees, heaps of stones, and the banks of rivers.

It is a remarkable circumstance, and one that affords a very pleasing proof of the wisdom of Providence, that, at the commencement of winter, these and other defenceless animals change their brown summer coat to one similar in colour to the snows of that inclement season. By such means they are able to elude the sight of many of their enemies, to the attacks of which they would otherwise be peculiarly exposed.

58. *The COMMON OTTER (Lutra vulgaris) is a large quadruped of dark brown colour, with short and thick legs, the hind feet naked, and the tail about half the length of the body.*

This animal is about two feet in length, exclusive of the tail. It has a short head and broad muzzle; the eyes are situated towards the front of the face; the ears are rounded and short; and the tail is very thick, particularly towards its origin.

The otter inhabits the banks of fresh-water rivers and streams, in many of the British counties; in other parts of Europe, in North America, and Asia, as far as Persia.

The depredations committed in rivers and fish ponds by this voracious animal, are not compensated by the

value of its *skin*, which however affords a fine fur of deep brown colour, particularly if the animal be killed in the winter; for then its shade is darker than at any other season of the year. Otters are generally either caught in traps, or chased by dogs, and men armed with long spears.

Their *flesh* is allowed by the canons of the Romish church to be eaten on maigre days, from its supposed resemblance to fish, on which otters almost wholly subsist. In the kitchen of the Carthusian convent near Dijon, Mr. Pennant saw the servants preparing an otter for the dinner of the religious of that rigid order, who, by their rules, are prohibited, during their whole lives, the eating of flesh.

It is possible so far to tame and educate these animals as to render them serviceable in catching fish. Many instances of this have been mentioned. An inhabitant of Christianstadt in Sweden had an otter which daily procured for him as much fish as served for the use of his family. Dr. Goldsmith speaks of having himself seen an otter plunge into a gentleman's pond at the word of command, drive the fish into a corner, and, seizing one of the largest, bring it off to his master; and in Bewick's History of Quadrupeds two instances of this proficiency are noted. In one of these it is stated that the otter would sometimes catch for his master as many as eight or ten salmon in a day. As soon as one was brought to the shore and taken from its mouth, it dived in pursuit of another; and when tired would refuse to fish any longer, after which it was rewarded with as much as it could devour.

The otter always hunts for his prey against the stream; and usually destroys several fish at a time, seldom devouring more than the upper part of their bodies. These animals fish in the sea as well as in fresh water; and their habitation is a den or burrow, which they form or find near the banks of rivers or other water, from which they can take food.

59. The SEA-OTTER (*Lutra marina*) is chiefly distin-

guishable from the common species by its hind feet being hairy, and the tail being only one fourth part as long as the body.

Its length, exclusive of the tail, is about three feet; and its fur extremely soft, and of deep glossy black or dark brown colour. The hind legs somewhat resemble those of a seal (23).

These animals are found on the sea-coast of Kamtschatka and the adjacent islands, as well as on most parts of the opposite coast of America.

A considerable trade in sea-otters' skins is carried on betwixt Russia and other nations. The Kamtschadales, on whose coasts the animals are chiefly killed, barter them with the Cossacks, and they with the Russian merchants. So little do the Kamtschadales value these skins, that they exchange them freely for an equal number of foxes' or sables' skins, which are much indeed inferior to them in value. The Chinese are the principal purchasers of them from the Russians; and they pay for them at the rate of from seventy to a hundred rubles each. This great price, and the distance from which they are brought, are the principal causes of their being seldom seen in Europe.

The best skins are those of such animals as are killed betwixt the months of March and May. The fur of the sea-otter is, in some respects, inconvenient as cloathing, on account of its being very thick and heavy, otherwise (independently of its greater size) it would be superior in value to the fur of the sable. Its colour is generally black, but sometimes brown like the fur of the common otter. The skins of the females are easily distinguished from those of the males, by being smaller, more black, and having the hair longest under the belly. It was the trade for these and other furs, at Nootka Sound, on the north-western coast of America, which, in 1788, had nearly occasioned a rupture betwixt this country and Spain.

The *flesh* of the young sea-otters is said to be an extremely delicate food, and scarcely to be distinguishable from that of lamb.

60. The COMMON BEAR (*Ursus arctos*, Fig. 5) is a

heavy looking quadruped of large size, which has a prominent snout, a short tail, treads on the whole sole of its foot; and is covered with shaggy blackish hair.

It is found in marshy woods of the northern parts of Europe and Asia, and is likewise found in Egypt, Barbary, and India.

The hunting of bears is an extremely important pursuit to the inhabitants of nearly all the countries in which they are found; and in many parts of the world it constitutes their principal and most profitable employ. The *skins* are made into beds, covertures, caps, and gloves. Of all coarse furs these are the most valuable; and, when good, a light and black bear's skin is one of the most comfortable, at the same time one of the most costly articles in the winter wardrobe of a man of fashion at Petersburgh or Moscow. In England bears' skins are used for the hammer-cloths of carriages, for pistol-holsters, and other purposes. The leather prepared from bears' skins is made into harness for carriages, and is used for all the purposes of strong leather.

Nearly every part of the bear is of use. Its *flesh* is a savoury and excellent food, somewhat resembling pork: and that of the paws is considered a delicacy in Russia, even at the imperial table. The *hams* are salted, dried, and exported to other parts of Europe. The flesh of young bears is as much in request in some parts of Russia as that of lamb is with us.

Bears' *fat* is frequently employed as a remedy for tumours, rheumatism, and other complaints. An *oil* prepared from it is adopted as a means of making the hair grow. This fat is likewise used by the Russians and Kamtschadales with their food, and is esteemed as good as the best olive-oil. The *intestines*, when cleansed and properly scraped, are worn by the females of Kamtschatka, as masks to preserve their faces from the effects of the sun, the rays of which, being reflected from the snow, are found to blacken the skin; but by this means they are enabled to preserve a fair complexion.

These intestines are also used instead of glass for windows. In Kamschatka the *shoulder-blade bones* of bears are converted into sickles for the cutting of grass.

The modes in which bears are caught or killed are too numerous to be described in this place. These animals chiefly frequent the most retired parts of forests; and their habitations are dens formed beneath the surface of the ground, in which they pass the winter in a state of repose and abstinence. In some countries, where they are suffered to live without much molestation, they are quiet and inoffensive animals; but in others they are extremely surly and ferocious.

61. *The WHITE or POLAR BEAR* (*Ursus maritimus*) is a quadruped of large size, sometimes measuring near twelve feet in length, and covered with long, coarse, and shaggy white hair; the head and neck much longer in proportion than those of the common bear, and the tail short.

The sea-shores of Greenland, and other countries within the arctic circle, as well as the immense islands of ice which abound in the Frozen Ocean, are frequented by great numbers of these animals.

The uses of the white bear are chiefly confined to the skin, the flesh, and the fat. Of these the *skin*, which is perhaps the most valuable part, is employed for beds, shoes, boots, and, in various ways, as leather. The *flesh* is eaten by the Greenlanders and the inhabitants of other northern countries, and is described to be as excellent as mutton, though this must be very doubtful when we consider the food on which these animals subsist. The *fat* is melted and employed instead of oil; that of the paws is used in medicine, for anointing rheumatic and paralytic limbs, and was formerly esteemed a sovereign remedy in these diseases. Of the *tendons*, when split into slender filaments, the Greenlanders make thread to sew with.

White bears are killed with spears; and are sometimes hunted with dogs, or killed with guns. They are savage, ferocious, and powerful animals; and so

great is their activity in the water, that they are frequently known to swim over tracts of sea, six or seven leagues, from one island or shore to another.

62. *The GLUTTON (Ursus gulo) is a small animal of the bear tribe, which has the back, muzzle, and feet of dark brown colour; the sides dusky, and the tail of the same colour as the body.*

It is about three feet in length, exclusive of the tail; and is a native of mountains and forests in the northern parts of Europe, Asia, and America.

In such esteem are the *skins* of these animals in Kamtschatka, that only the most wealthy of the inhabitants can afford to wear them; and females, when full dressed, ornament their hair with the paws. They indeed value this kind of fur so highly as to assert that the heavenly beings wear garments made of it; and no Kamtschadale can present to his wife or mistress a more acceptable gift than one of these skins. In Lapland they are sold at very high prices; and are used for muffs and the linings of coats. From the skin of the legs the Lapland women cut out gloves, which they work with a kind of tinsel wire, drawn through a machine made of the skull of the rein-deer. The fur is of glossy black colour, and shines with peculiar lustre, reflecting different shades of light, according to the different positions in which it is held. The *flesh* of these animals is sometimes eaten in Greenland.

It is said to be the habit of the gluttons to climb into trees, and to drop from the branches upon the backs of deer and other animals which happen to pass beneath, and on which they can prey. They also feed on hares, mice, birds, and even on putrid flesh; and are said to be voracious in an extreme degree.

63. *The RACCOON (Ursus lotor) is a slender and somewhat fox-shaped quadruped belonging to the bear tribe; and is peculiarly distinguished by having a dusky stripe along the nose, and the tail marked with black rings.*

This animal is chiefly found in the woods of North America.

The *fur* of the raccoon is so soft and useful as to be sometimes employed instead of beaver in the making of hats. It is also used for the linings of garments; and the *skins*, when properly dressed, make good gloves and upper leathers for shoes. The *flesh* is eatable.

64. The *BADGER* (*Ursus meles* Fig. 6) is a small animal of the bear tribe, which has coarse hair, of grey-colour on the upper parts, and black beneath; and a long, black, pyramidal stripe on each side of the head; its body and legs are thick, and the teeth and claws peculiarly strong.

This animal is found in several of the woody districts of England, as well as in nearly all the temperate parts of Europe, and is about the size of a small pig.

In various particulars the badger is an useful animal to mankind. Its *flesh*, which is somewhat similar in taste to that of the wild dog, is much esteemed in Italy, France, and Germany, and may be made into excellent hams, and bacon. The *skin*, when dressed with the hair on, makes excellent knapsacks, and covers for pistol furniture and travelling trunks. For all these purposes it is frequently used, as it is impervious by rain, and needs no additional preparation to render it water-proof. In the paralytic complaints of old persons, it is asserted that the hairy skin of the badger, worn next to the body, has been of great service, by stimulating the nerves into action. The *hairs* or bristles are made into brushes for painters; and the *fat* is applied to many useful purposes, both externally and internally, in medicine.

Badgers are generally caught in sacks fastened at night, when the animals are abroad in search of food, into the mouth of their burrows in the ground. When these are fixed, the animals are hunted home from the adjacent fields with dogs, and, on entering their usual places of retreat to escape from their foes, they are immediately seized and tied up in the sacks by men who are stationed at hand for that purpose. Badgers are also sometimes caught by steel traps placed in their haunts.

These animals subsist principally upon roots and other vegetable food, which they scratch and root out of the ground during the night. Their dens or burrows are generally formed in woody places, or the clefts of rocks. Though in almost every respect innoxious, they are endowed with such strength as successfully to oppose the attacks of animals apparently much more powerful than themselves.

65. *The VIRGINIAN OPOSSUM* (*Didelphis opossum*) is a whitish-coloured animal about the size of a small cat, but with feet somewhat like those of the monkey, slender muzzle, and scaly tail; the female has a pouch or bag on the under part of the body, in which she places her young ones, when very small; and where they afterwards find a place of retreat from danger.

This species of opossum are numerous in Virginia, Louisiana, Surinam, and other warm and temperate parts both of North and South America.

Notwithstanding the disgusting smell of these animals whilst alive, when dead and skinned, their *flesh* is as sweet and excellent as any other animal food. All the American travellers who have partaken of it appear to agree that it much resembles that of sucking pig. The *hair*, which is of considerable length, is spun, by the American Indians, into thread, dyed red, and then woven into girdles and other parts of dress.

66. *The COMMON MOLE* (*Talpa europæa*) is a small and well-known British quadruped of black colour, with broad fore feet, large head terminating in a slender snout, extremely small eyes, no external ears, and short tail.

In former times the *skins* of moles were in great esteem for many purposes both useful and ornamental. They were employed for the linings of winter garments, and for trimmings in several kinds of dress and were even made into coverlets for beds. At present, although, by a late invention, the down or fur, which is as soft as the finest velvet, has been adopted in the manufacture of hats, they are so little esteemed in this country that

the mole-catchers in general can find no sale for them. The *flesh* of the mole is eaten in some countries, but the animals are too small to be used with any advantage as food.

Moles live only in burrows or galleries which they dig, under the surface of the earth, with their strong fore feet, and they are chiefly caught to prevent the injury which they are imagined to do to the farmer by throwing up the mould, in little hillocks, in different parts of his grounds. The mode of catching them is by traps placed in their galleries, by persons employed for that purpose, and who are paid for their trouble at a stipulated rate per dozen.

Moles feed on roots, worms, and the grubs or caterpillars of insects. They are generally considered to be both blind and deaf, but they possess every requisite organ both for sight and hearing: indeed their quickness of hearing is such that they take alarm, and seek for safety in flight, at even the most distant approach of danger.

Moles are believed, by some persons, to be useful and not injurious to the farmer. In cold clayey land their operations are supposed to have a tendency to drain the soil, and to be beneficial in communicating air to the roots of plants; they are also thought to be serviceable by raising fresh mould upon grass-land, and feeding on the grubs of several kinds of insects which subsist on the roots of the grass.

67. The *HEDGE-HOG* or *URCHIN* (*Erinaceus europæus*) is a small British quadruped, the upper parts of which are covered with spines, each about an inch long, and the under parts covered with hair.

These animals are of considerable utility in several points of view. If kept and allowed to run about in rooms that are infested with beetles, cock-roaches, or crickets, they will destroy the whole of them. Some persons imagine that they will devour mice, but this wants authentication. A hedge-hog which was kept at

the Angel Inn at Felton, Northumberland, was tamed, and employed as a turnspit (40). The *flesh* of the hedge-hog is occasionally used as food, and is said to be very delicate eating. The *skin*, which was frequently employed by the ancients as a clothes brush, is now used by farmers, in some parts of the Continent, to put on the muzzles of calves which they are about to wean, that the cow may not permit them to suck. Several of the old writers have related accounts of very extraordinary, and at the same time very absurd, medicinal effects from different parts of this animal.

Hedge-hogs sleep in the day-time, and are awake during the night, when they run abroad in search of worms, snails, insects, and other food. Few creatures can be more inoffensive. When attacked they defend themselves by rolling into a globular form, and opposing, on all sides, a spinous surface. There is a notion, but it is apparently an unfounded one, that hedge-hogs suck the milk of cows whilst lying in the fields asleep; and that they stick fruit upon their prickles, and thus carry it off to their habitations.

ORDER IV.—GLIRES.

68. *The COMMON PORCUPINE* (*Hystrix cristata*) is a quadruped, the upper parts of which are covered with quills or spines six or seven inches in length, each variegated with black and white rings; and its head has a crest of smaller spines.

This animal, which is common in exhibitions of wild beasts in this country, and is about two feet in length, is found wild in Spain and Italy, as well as in several parts of Africa, Asia, and America.

In America porcupines are hunted chiefly on account of their *quills*, which are applied by the Indians to many useful purposes. The women dye them of several beautiful colours, split them into slips, and weave them into bags, belts, baskets, and other articles, the neatness and elegance of which would not disgrace more enlightened artists. The *flesh* of the porcupine is

said to be excellent eating, and, at the Cape of Good Hope, is frequently introduced at the tables even of the principal families.

It was formerly believed that these animals, when attacked, had a means of defending themselves by forcibly darting their quills at the aggressor; but this opinion has been fully refuted. Their principal mode of defence is by throwing themselves on one side, and erecting their spines against the assailant. They live in dens under the ground, and are chiefly in motion during the night, in search of fruit, roots, and other vegetables, which constitute their principal food. Though apparently heavy and inactive animals, they are able to climb even to the tops of the highest trees, with great facility.

69. The *BEAVER* (*Castor fiber*, Fig. 25.) is a quadruped, with smooth, glossy, and chesnut-coloured hair; and a flat, oval, and naked tail, marked into scaly divisions, somewhat like the skin of a fish.

These animals inhabit the banks of rivers and lakes in woody and unfrequented parts of the north of Europe, Asia, and America: their general length is betwixt two and three feet.

In ancient times the beaver is supposed to have been found wild in this country, and its *skin* was so valuable as to constitute the chief and most valuable fur which the island produced. The *hair* is of two kinds, of which the upper is long and thick; and the lower, or that immediately next to the skin, is of dark brown colour, short, close-set, and as soft as down. In commerce a distinction is made betwixt fresh, dry, and fat beaver' skins. Of these the first are obtained from animals that are killed in the winter; the second sort from those taken during the summer; and the third or fat sort are such as have been carried, for some time, on the bodies of the American Indians, who, as it were, tan the skins with their perspirable matter. It is the fur of the first sort which is chiefly manufactured into

hats; but the fat skins are esteemed the most valuable in consequence of the long hairs having been worn off, and the fine downy fur being left perfectly free from them. Each full-grown beaver yields about twenty-four ounces of fur. This, besides hats, is wrought into gloves, caps, stockings, and other articles of dress. The *skin* of the beaver, as leather, serves for saddles, the upper leathers of shoes, gloves, the covering of trunks, &c. The Russians sell great numbers of these skins to the Chinese, but, probably, the greatest traffic in them is from North America. We may form some idea of the numbers which are exported from that country, when it is stated that more than 50,000 skins have been vended by the Hudson's Bay Company at one sale; and that, in the year 1798, no fewer than 106,000 beavers' skins were collected in Canada, and exported thence into Europe and to China.

Besides their fur these animals furnish a valuable substance, which is known by the name of *castor** or *castoreum*, and is contained in two little bags, called the inguinal glands, each about the size of a hen's egg. This substance is of a brownish oily consistence, has a disagreeable narcotic smell, and a bitterish, acrid, and nauseous taste. The castor which is imported from Russia is generally esteemed the most valuable; though in many cases that from Hudson's Bay has been found nearly if not fully equal to it. Castor has been long celebrated as a remedy in hysterical complaints; and has been frequently used with advantage in languid habits and constitutions.

The American Indians are partial to the *flesh* of the beaver, and they use its *teeth* for the cutting, hollowing, and polishing of wood; they also clothe themselves in beavers' *skins*, and, in winter, wear them with the hair next to their bodies as a defence against the cold.

Beavers are only found in the most retired situations,

* This is perfectly distinct from castor oil, which is the production of a vegetable seed.

always in the immediate neighbourhood of water, and generally in extensive communities.

70. The *CHINCHILLA* (*Muslaniger*) is a small quadruped of the rat tribe, which has a beautifully soft grey fur.

The *fur* of this animal, which is a native of some parts of South America, was formerly used by the Peruvians, as a fine kind of wool, and was spun and woven into stuffs of extremely delicate texture, to which they attached great value. Of late years, however, the manufacture of it has been much neglected. As a fur, the skin of the chinchilla is much in request in this country, in consequence of its having become a fashionable trimming for ladies' dresses, and a favourite article for muffs.

71. The *GREYSQUIRREL* (*Sciurus cinereus*) is a quadruped about the size of a rabbit, which has the upper parts of its body grey, and the under parts white. It is found in America, and in some countries of the north of Europe.

The *skins* of these animals are sometimes used as a fur for the lining of winter garments, and are frequently imported into England, but they are not of much value. As, however, they are very tough, they are tanned and employed in America for many of the purposes of leather, but particularly for the making of ladies' shoes. The Laplanders, in winter, annually make war upon the troops of grey squirrels which are found in some parts of their country. This they do chiefly for the sake of their skins, which they make up into bundles of about forty each. But no merchandize is more liable to deception than this. The purchaser receives them without examination, the skins are packed with the fur inward, and all the bundles are sold at the same price.

In several of the plantations of North America these animals, from their immense numbers, and the devastations they commit, are greatly injurious to the inhabitants. Rewards for their destruction are consequently given; and, in Pennsylvania alone, more than 600,000 of them have, in some years, been destroyed.

The grey squirrels reside chiefly in trees, but lay up

stores of provision, for winter, in holes which they dig in the ground. They are extremely agile animals, and run about among the branches with as much facility and security as upon the ground.

72. The *BLACK SQUIRREL* (*Sciurus niger*) is a small black quadruped of the squirrel tribe, which is not uncommon in North America and New Spain.

The finest furs which the Iroquois Indians possess are those of *black squirrels*. These they make into robes and garments, which they sell at a price as high as seven or eight pistoles each.

73. The *COMMON HARE* (*Lepus timidus*, Fig. 26) is distinguishable from all other animals of its tribe by the ears being tipped with black, and longer than the head; the hind-legs being half as long as the body, and the tail short.

It is found in every quarter of the world except Africa.

Notwithstanding the great estimation in which the *flesh* of the hare is now held as food, it was absolutely forbidden by the Druids; and was abhorred by the Britons for many centuries after the abolition of that order. At the present day it is not eaten by the inhabitants of many eastern nations. It is prohibited by the Mahometans and Jews; and the Copts, who have adopted many of the Jewish customs, refrain from it. The ancient Romans, however, considered it so great a delicacy for the table, that Martial styles the hare, in this view, the first of quadrupeds.

The *fur* of the hare forms an important article in the manufacture of hats, and vast quantities of hares' skins are, for this purpose, annually brought from Russia and Siberia. This is the chief use which we make of them; but, in some parts of the Continent, the fur is spun and woven into a kind of cloth. The inhabitants of Dalecarlia, a province of Sweden, set a peculiar value upon such cloth, from an opinion that it is itself so attractive to fleas as to preserve the wearer from their attacks! The Romans spun the fur both of the hare and rabbit into cloth; but Pliny says that such cloth was neither soft nor durable.

In the extreme northern countries, where the frosts of winter are intense, and where snow lies upon the ground for many successive months, all the hares, at the approach of that season, change their coat, and, instead of retaining a coloured fur, become perfectly white.

The chase of the hare is, at this day, a popular amusement in most parts of England; and four or five centuries ago it was so much followed, that even ladies had hunting parties by themselves, in which they rode astride upon the saddle.

It is sometimes difficult to ascertain the excellence of hares for the table, but the following directions may be of use. When newly killed the body will be stiff, and the flesh of pale colour; but when a hare has been some time killed the body becomes limber, and the flesh gradually turns black. A young hare may be known from an old one, after it is dead, by the bones of the knee joint. If, on thrusting the thumb-nail against this joint, the bones are somewhat separate, the hare is young; if there be no space, it is old; and the greater the separation, the younger the animal may be considered. The under jaw of a young hare may easily be broken, and the ears easily torn; the cleft also of the lip is narrow, and the claws smooth and sharp. In an old hare the cleft of the lip spreads very much, the claws are blunt and rugged, and the ears dry and tough. Hares may be kept better if they are not opened for four or five days after they are killed; and they are considered in the best state for the table when the colour of the flesh is beginning to turn.

So numerous are these animals in some parts of England, where attention is paid to preserving the breed, that they become greatly injurious to the crops of all the neighbouring farmers. They feed upon green corn, clover, and other useful vegetables; and frequently commit much damage in young plantations, by eating the bark from the trees. Some years ago a gentleman in Suffolk found it necessary to destroy the hares near some new plantations, and 1082 were ascertained to have been killed.

74. *The ALPINE HARE* (*Lepus Alpinus*) is a *Siberian animal, destitute of tail, of tawny colour, with rounded, brown ears, and brown feet.*

Amongst the mountains of Siberia alpine hares are very numerous. They live in burrows or holes under ground, and store up, beneath the shelter of trees or rocks, large ricks of dried grass and other vegetables for their winter's subsistence. These collections are anxiously sought after by persons engaged in the hunting of sables (55); and, in many instances, they are the means of preserving their horses from perishing by famine. Some of the adjacent peasantry also search them out as food for their horses and cattle. The *skins* of the alpine hares supply one of the articles of commerce betwixt the Russians and Chinese.

75. *The RABBIT* (*Lepus cuniculus*) is a *British quadruped belonging to the same tribe as the hare; and is principally distinguishable from that animal by its proportionally shorter ears, and by the hind legs being only one-third of the length of the body.*

The colour of the wild rabbit is dusky brown above, and paler or whitish on the under parts. In the domestic rabbit the colour is various, white, grey, black, or black and white.

These animals inhabit nearly all the warmer parts of Europe, as well as several of the temperate countries of Asia and Africa.

There are farms in many parts of England, particularly in Lincolnshire, Norfolk, and Cambridgeshire, where the breeding of rabbits is rendered an extremely advantageous pursuit. The most desirable situations are those in which the soil is loose and sandy, and where the ground rises, in different parts into low hills. Such lands can be more profitably employed as rabbit-warrens than any others, from the greater facility with which the animals are able to form their burrows in the earth, and the less liability they have to be flooded, by the falling of heavy rains.

In a commercial view rabbits are animals of much greater importance than hares; because, from their habit of living in greater numbers together, they can

be better attended to and managed ; and also because they multiply much more rapidly than hares. Their fecundity, indeed, is truly astonishing. They breed several times in the year, and generally produce seven or eight young ones at a birth ; and it has been calculated that, if the progeny from a single pair could, without interruption, proceed in the same ratio for four or five years, the whole stock would, even in that short period, amount to more than one million.

The particular uses of the rabbit are nearly the same as those of the hare (73). The *fur* is a principal substance employed in the composition of hats ; and such parts of it as are unfit for this purpose may advantageously be adopted for the stuffing of beds and bolsters. Rabbits' skins are also sometimes used as a cheap and warm trimming for female dress ; and the *skins* themselves, after the hair has been stripped from them, are boiled down, and made into size or glue. The *flesh*, though, like that of the hare, forbidden to the Jews and Mahometans, is a very delicate and palatable food. We are informed by Pliny, the Roman naturalist, that the ancients had a favourite dish which was made of sucking leverets or rabbits unpaunched. The modes of ascertaining the quality of rabbits as food are nearly the same as those which have been mentioned respecting the hare.

It is customary, in most warrens, to use ferrets (56) in the catching of these animals. The ferrets are muzzled and put into the burrows ; and, by pursuing the rabbits under ground, they alarm and drive them into nets that are placed over the outlets. In open and extensive grounds other modes are adopted. These, as we are informed by Mr. Daniel, in his work on Rural Sports, are by implements called fold-nets, spring-nets, and a kind of trap called tipes. The *fold-nets* are set, about midnight, between the burrows and the feeding grounds ; the rabbits being driven into them with dogs, and kept enclosed in the folds till morning. The *spring-net* is generally laid round a haystack, or some other object of inducement for rabbits to collect in

numbers. The *tipe* consists of a large pit or cistern, covered with a floor. This has, near its centre, a small trap-door nicely balanced, into which the rabbits are led by a narrow road or *meuse*. It was customary formerly to set this kind of trap near a hay-stack; but, since turnips are now grown as food for these animals in an enclosure in the interior of the warren, it is placed within the wall of this enclosure. For a night or two the rabbits are suffered to go through the *meuse* and over the trap, that they may be familiarized to the place where the turnips are grown. After that the trap-door is unbarred, and immense numbers fall in. On emptying the cistern, the fat rabbits are selected and killed, and the others are turned out upon the turnips to improve. Five or six hundred couples have not unfrequently been taken in one night by this contrivance; and once, in the Driffield warrens, as many as fifteen hundred couples were caught.

Many persons breed rabbits in a *tame* or *domestic state*. The *skins* of these are useful; but, for food, the wild animals are greatly preferable. Care should, at all times, be taken to keep them clean; and, during the breeding season, the males and females must be kept apart. The best food for tame rabbits is the shortest and sweetest hay that can be had; and one load of this will serve two hundred couples for a year.

ORDER V.—PECORA.

76. The ARABIAN CAMEL, or DROMEDARY (*Camelus dromedarius*, Fig. 7), is distinguishable from every other species of camel, by having a single bunch upon the middle of its back.

This animal, which is a native of many of the deserts of Asia and Africa, is of a tawny grey colour, and has soft hair, which is longer on the neck, under the throat, and on the haunch, than elsewhere.

The Arabian, like all other species of camel, has its upper lip cleft, and its feet with two long hoofs on which it treads, and two others shorter, which do not touch the ground.

These animals constitute the principal source of riches, and the whole force and security, of the Arabians. They are the only beasts by which the inhabitants of the sandy deserts of many parts of Asia could travel or convey their burdens. Their tough and spongy feet, which are peculiarly adapted both to the climate and the country, and their abstemious temperament, but particularly their capability of travelling without water, for many successive days, enable them to perform such journeys as would destroy, probably, any other species of quadruped. The caravans, or troops of merchants, that traverse, in all directions, the deserts of Egypt and Arabia, are always accompanied by camels, which are often more in number than the men. These commercial travels are sometimes to the distance of 700 or 800 leagues, and are usually performed at the rate of ten or twelve leagues a day, the camels being, every night, unloaded to rest and feed. For the latter purpose, if better provender cannot be had, they are contented with a small quantity of dates or a few beans, together with the scattered and oftentimes bitter herbage which the desert affords. The burden of each camel usually weighs about half a ton; and, at the command of his conductor, he kneels down for the greater convenience of being loaded. It is from this practice that we account for those horny parts that are observable on the bellies, knees, and limbs, even of the animals that are exhibited in England. Camels are trained, from the earliest part of their life, to the labours which they are afterwards to perform: and, with this view, when but a few days old, their limbs are folded under their body, and they are compelled to remain on the ground whilst they are loaded with a weight, which is gradually increased as they increase in strength. As soon as they have acquired sufficient strength they are trained to the course, and their emulation is excited by the example of horses or of other camels.

The pace of the camel is a high and swinging trot,

which, to persons unaccustomed to it, is at first disagreeable and apparently dangerous, but is afterwards sufficiently pleasant and secure. The Arabians, in general, ride on a saddle that is hollowed in the middle, and has, at each bow, a piece of wood placed upright, or sometimes horizontally, by which the rider keeps himself in the seat. A ring is inserted into the nostrils of the camel, to which a cord is affixed; and this serves as a bridle to guide and stop him, or to make him kneel when the rider wishes to dismount. Mr. Bruce informs us that, in the caravans of one of the Abyssinian tribes, the people sometimes ride two together on each camel, and sit back to back.

The camels of Sahara are probably more fleet than any that are known; and, on these animals, the Arabs, with their loins, breast, and ears bound round, to prevent the injurious effects of percussion from the quickness of motion, can cross that great desert in a few days. With a goat's skin or a porous earthen pitcher filled with water, a few dates, and some ground barley, the Arab travels from Timbuctoo to Morocco; feeding his camel but once upon the road. In one instance a camel was known to travel from Fort St. Joseph, on the river Senegal, to the house of Messrs. Cabane and Depras at Mogador, a distance of more than 1000 miles, in seven days.

It has been observed that the camel is the most completely and most laboriously enslaved of all animals; the most completely, because, in the other kinds of domestic animals, we find at least some individuals in their natural state, and which have not yet been subdued by man: but the whole species of the camel is enslaved; and not any of them are now to be found in their primitive state of independence and liberty. He is the most laboriously enslaved because he has never been trained, but as a beast of burden whom man has not harnessed nor taught to draw, but whose body is considered a living carriage which may be loaded and oppressed.

The above are not the only uses of the camel. The

hair or fleece of these animals, which is renewed every year, and which regularly falls off in the spring, is so soft that the finest parts of it may be manufactured into stuffs of beautiful texture: and, in Europe, when mixed with the fur of the beaver (69), it is sometimes made into hats. The inhabitants in some parts of Sahara live in tents formed of woven camel's hair; this forms a thick covering completely water-proof. After the hair has been stripped off, the *skin* is converted into leather.

In Arabia the *milk* of the camel is a most important article of nutriment; and the *flesh*, though dry and hard, is not unpalatable, particularly when young. By the inhabitants of Egypt camels' flesh is so much esteemed, that, at Cairo and Alexandria, it was formerly forbidden to be sold to Christians. In many parts of Africa the *tongues* are salted and dried, both for use and exportation; and, with the ancient Romans, the *heels* of camels were eaten as a great delicacy.

77. *The BACTRIAN, or TWO-BUNCHED CAMEL* (*Camelus bactrianus*), is known by having two bunches on its back; and by being somewhat larger, and having shorter legs than the Arabian species.

This animal is found in Usbec Tartary, the ancient Bactria: it is likewise a native of Siberia, Thibet, and some parts of China.

The purposes to which the Bactrian camel are applied are the same as those already described respecting the Arabian species (78). These animals, however, are sufficiently hardy to sustain the climate of the temperate parts of Siberia, and to be able, without injury, to traverse even humid and marshy countries, which would soon prove fatal to the Arabian camel.

78. *The LLAMA, or GLAMA* (*Camelus glama*), is a South American species of camel, of small size, which has a protuberance on the breast, and no bunch on the back.

The colour of the llama is white, grey, and russet, variously disposed. Its height, to the top of the back, is somewhat more than four feet, and to the head nearly six feet.

Without the aid of these animals, the Spaniards who inhabit the mining districts of South America would labour under great inconveniences for the transport of their merchandise and treasures: since mountains that are altogether inaccessible to the horse, are with facility traversed by the llama. This beast, though not so patient, is nearly as abstemious as the camel. He proceeds, when loaded, with a slow but sure pace, and performs journeys, in these mountainous regions, more than 200 leagues in extent. Sometimes he will travel four or five days successively without appearing desirous of repose, and then he rests spontaneously, for twenty or thirty hours, before he resumes his toil. Like the camel, these animals kneel to be loaded; and they are directed in this, and in most other of their motions, by their conductor's whistle. The value of the best llamas is about eighteen ducats, and of the common ones twelve or thirteen ducats each. The burdens they are able to carry are from 150 to 200 pounds' weight: and the number of llamas that are kept in actual employ is supposed to exceed 300,000.

Of the *skin* of the llama a hard kind of leather is made, which is converted into harness, the soles of shoes, and to many other useful purposes. But, as it is only tanned, and not curried, it is soon injured by exposure to wet. The *hair*, or fleece, particularly of the wild llamas, which is longer than that of the animals in a domesticated state, is much in request for the manufacture of camlets and other stuffs, some of which are of very beautiful texture, and also for the making of hats. On this account the animals are frequently hunted in the plains with dogs, or killed with guns; but such is their activity amongst rocks, that, if they can once reach these, the hunters are generally obliged to desist from any further pursuit. The *flesh* of the llama is a wholesome and excellent food. Sometimes it is salted, and, in this state, like our salt beef, is adopted as provision for ships proceeding on long voyages. That; however, of the young llamas four or five months old is

preferred, and is considered as good as veal. Many parts of these animals are adopted by the inhabitants of South America as medicines.

79. *The VICUNA* (*Camelus vicugna*) is a small South American species of camel, with woolly fleece, a flat and blunt nose, an erect tail; and without any bunches.

This animal inhabits, in a wild state, and in extensive flocks, the highest peaks of the Andes.

Unable to sustain burthens exceeding sixty or seventy pounds in weight, the vicuna is seldom employed in the transport of merchandise. It is chiefly in esteem on account of its *fleece*, which is of a dead rose colour, and as soft and valuable as silk. This, in South America, is spun and woven into gloves, stockings, quilts, carpets, and innumerable other articles, which are sold at great prices, and constitute an important branch of commerce.

In most of their habits these animals have a close alliance with the llama, and their general figure is nearly the same. They are gentle and inoffensive, and, though not tamed with quite so much facility, are capable of great attachment towards those who have the care of them. Amongst their native mountains they are so light and agile, in all their motions, that it is not easy to come within reach of them, except by stratagem; and, consequently, though dogs are sometimes employed to hunt them, they are much more frequently killed by snares or traps than in any other way.

In consequence of the great advantages which, in America, are derived from the wool of the vicuna, the Spaniards were, some years ago, induced to attempt the introduction of these animals into Europe. Some of them were brought to Spain; but, from want of proper attention to their natural habits, the experiment entirely failed.

80. *The MUSK* (*Moschus moschiferus*, Fig. 27) is a small quadruped, somewhat shaped like a deer, but without horns: it has two projecting tusks curved downward, a short

tail; and, about the middle of the under part of the male, there is an oval bag, about the size of a small egg.

This animal is seldom more than about two feet in height at the shoulder, and is clad with long, upright, and thickset hair. Each hair is waved, and of three different colours; the tip ferruginous, the middle black, and the bottom dusky.

It inhabits the mountains of Thibet, Tonquin, and Siberia.

The drug called *musk* is a brown fatty substance, which appears somewhat like clotted blood. It is contained in the bag or receptacle under the belly, which has two small external orifices; through these, when it is overcharged, the animal squeezes it out upon trees or stones. The mode in which musk is collected for sale is to kill the animals, cut off the bags, and tie them closely up to prevent it from being spoiled by evaporation. In those countries where the animals are most abundant they are pursued in the autumn and winter, and generally with so much success that many thousands of bags are annually collected. It is, however, presumed that, of those which are sold, many are factitious, formed of other parts of the skin, and filled with musk adulterated by mixture with other substances. Indeed, so valuable is this drug, that it is seldom to be obtained in a pure state. To increase its quantity blood is not unfrequently mixed with it; and, to increase its weight, lead finely ground, and sometimes even little bits of lead, are put into the bags. The natives of India are said to have various methods of detecting this adulteration, by the taste and the weight; but, principally, by a thread steeped in the juice of garlic, which they draw through the bag with a needle; this, if it retain the smell of garlic, is considered a decisive indication of the musk having improper ingredients mixed with it. The purest musk is said to be that which is brought from Patna, in the dominions of the Great Mogul, where it is collected from various parts of the interior of the country. It is imported into Europe in bags, each of which is about the size of a pigeon's egg, well filled, and covered with short brown hair.

Musk was formerly much used as a perfume. It is now chiefly in repute as a medicine in spasmodic, convulsive, and other complaints; and, when properly given, is thought a remedy of great service. So powerful is the scent of this drug, that the smallest particle of it will perfume a very considerable space; and, when the bags are fresh, if one of them be opened in a close apartment, every person present is obliged to cover his mouth and nose with several folds of linen, to prevent suffocation.

In all the countries where these animals are found, their *skins* are in great request as a strong and valuable leather; and, when tanned and properly prepared, the Russians have a method of rendering this nearly as soft and shining as silk. These skins are also sometimes dressed as *furs* for winter clothing. The flesh of the musk is frequently eaten; but that of the young ones only is tender and of good flavour.

These animals, which are astonishingly light and active in all their motions, and at the same time of inoffensive and timid habits and disposition, are caught by snares placed near their feeding places; are shot with arrows, and sometimes killed by cross-bows, so placed that they discharge arrows, by the animals treading on a string connected with the trigger.

81. *The ELK, or MOOSE DEER* (*Cervus alces*, Fig. 8), is the largest species of deer that is known, and is distinguished from all others by having broad and flattened horns with several points, no brow-antlers, and a hairy protuberance on the throat.

In size these animals are frequently larger than a horse. Their upper lip is square, very broad, deeply furrowed, and hangs over the mouth. The hair of the male is black at the points, dusky in the middle, and white at the roots; that of the female is of sandy brown colour, except under the throat, belly, and flank, which are whitish. The males only are horned.

The elk inhabits the forests of North America, of some parts of Europe, and of Asia as far south as Japan.

Strong and powerful as these animals are, it has been found possible to domesticate and train them to labour. Mr. Livingston, at a farm near New York, made the experiment by breaking two elks to the harness. After having been only twice bitted, though two years old, they appeared equally docile with colts of the same age, applying their whole strength to the draught, and proceeding in a steady pace. The motion of these animals is a shambling kind of trot, but it is very rapid, and, in drawing carriages, they are able to out-travel a horse. They are also less delicate in their food than horses, are long-lived, and more productive than any known beast of burden, having annually from one to three young ones at a birth. Elks were formerly used in Sweden for the drawing of sledges; but as they were frequently employed in the escape of criminals from justice, the use of them was prohibited under severe penalties.

The inhabitants of all countries where the elk is found esteem its *flesh* a sweet and nutritious food, though the grain is coarser than that of most other kinds of venison. The American Indians assert that they can travel further, after having eaten of it, than of any other animal food. After having been properly salted and dried, the *tongues* are better than those of the ox; and the nose, when cooked, is stated to eat like marrow, and to be one of the greatest delicacies which are produced in Canada. Of the *skins* an excellent buff leather is made, which is strong, light, and soft. This leather is used by the Indians for tent-covers, snow-shoes, and the coverings of canoes. The long *hair* of the elk is well adapted for the stuffing of mattresses and saddles.

In Canada the hunting of the wild elk is a frequent but in general a most laborious, pursuit, which chiefly occupies the attention of the Indians during winter, when the whole surrounding country is covered with snow.

In a wild state these animals browse the thick and

lofty grasses of the plains, and the leaves and tender branches of trees. During the summer they frequent the banks of rivers and lakes; and in winter they often traverse vast distances upon the frozen snow. Notwithstanding the natural strength of their body, their disposition is so mild and inoffensive, that, even when pursued and attacked, they seldom attempt any resistance.

82. *The REIN-DEER (Cervus tarandus, Fig. 28) is known by its horns being long, bent back, slender, branched, and generally broad at the extremities.*

It is about four feet and half high at the shoulder, and is of brown or greyish white colour above, and white on the under parts of the body. Both the sexes are horned.

These animals inhabit several of the alpine districts of America, and of the northern countries of Europe and Asia.

Useful and even indispensable as many of the domestic animals of this country are to us, the rein-deer is infinitely more so to the Laplander. For travelling, and the conveyance of heavy burdens in sledges and carriages, he supplies the place of the horse; and such is the speed with which he traverses the frozen snows of that dreary region, that he is able, with ease, to perform a journey of near a hundred miles in one day. To this labour the animals are trained from the earliest period of their lives: and neither darkness nor storms can essentially impede their progress. The usual mode of travelling is in sledges, to which one or more of the animals are yoked. The sledges are extremely light, somewhat shaped like a boat, having at the back an upright board for the driver to lean against. Being rounded and not flat underneath, much dexterity is requisite in the balancing and management of them. The driver is tied in, and protected by a cover which encloses all the lower parts of his body, and shelters him from the inclemency of the weather. The rein-deer is yoked by a collar, from which a trace is brought under the belly between the legs, and fastened to the fore part of the sledge; and the animal is

guided by a cord or rein fastened to its horns, and tied to a hoop held upon the driver's right thumb. He directs the course of the deer by pulling the rein on the side he would have him go, encouraging him at the same time with his voice. In general, the Laplanders can travel with ease about thirty miles without stopping.

To persons unaccustomed to the habits of the Laplanders and their animals, it will appear wonderful that they should be able to travel during the winter, by night as well as by day, the earth presenting one uniform surface of snow, and not a single vestige of human industry and labour being discernible to direct their course; the snow, at the same time, flying about in all directions, and almost blinding them. Yet it is certain that they are under no difficulty in finding the spot to which they are bound; and dangerous as these journeys may seem, they rarely experience any accident. When several persons are travelling in company, they fix bells to the harness of the animals, that the whole may be kept together by hearing when they cannot see each other, after the light of their short day has failed them. To guide them in their course, the Laplanders observe, in the day-time, the quarter whence the wind blows, and, at night, they are directed by the position of the stars. The missionary Leems, who resided ten years amongst the Laplanders, remarks that, during the whole of that time, he did not remember more than one fatal accident to have occurred from this mode of travelling.

As the rein-deer supplies, to the Laplanders, the place of a horse for conveyance and carriage, so it is an invaluable substitute for the cow in affording them food. The females supply them with *milk*, each yielding about as much as a common she-goat. This, though not so thick as the milk of the cow, is said to be sweeter and more nutritive: and produces them both butter and cheese. The mountain Laplander subsists, through the whole winter, upon these, or upon *flesh* of the rein-deer,

slaughtering two or three every week, according to the number of his family. The animals are killed by stabbing them in the neck, and the wound is so dexterously inflicted that no *blood* flows from it; but this is found in the inside, whence it is carefully taken out, and prepared for use. The *fat* of the rein-deer serves also for food.

Of the *skin*, after it has been properly prepared, the Laplanders make garments, gloves, shoes, and caps, which cover them from head to foot, and protect them against the cold. These skins also serve as interior coverings for tents, as linings and coverings for sledges, and as beds. They are more or less valuable, according to the season in which the animals have been killed. If slain in the spring, the hides are found to be perforated, in various parts, by a species of insect which lays its eggs in them; but if the deer be killed in winter the skin is free from these defects. The Laplander, however, desirous of obtaining the same price for a defective skin as for a perfect one, frequently attempts to defraud the purchaser by artfully closing up the holes in such manner as to render them scarcely visible.

The *horns* are converted into handles for different kinds of instruments, and an excellent glue is made of them. The *bones* are likewise of use; and the *sinews* or tendons of the legs, after having been held before the fire and beaten with wooden hammers, are divided into filaments as fine as hair, which answer all the purposes of thread; and these filaments twisted together, serve for bowstrings and cords of different kinds.

So numerous and important are the uses of the rein-deer in Lapland, that there are few inhabitants of that country who do not possess them; and some of the wealthiest Laplanders have herds consisting of more than 1000 head. In the summer-time these feed on divers plants which flourish during that season; but, in winter, they either browse on the rein-deer liverwort (*Lichen rangiferinus*), which they dig up from beneath the snow with their feet and horns; or on another kind

of liverwort, which hangs on the branches of fir-trees, and which affords them sustenance when the snöws are too deep or too hard frozen to allow them to reach that.

Wild rein-deer live in the mountains and woods, and the hunting of them is, in general, attended with excessive fatigue; as they are endowed with astonishing muscular powers, and also possess a nicety and acuteness of precaution which can scarcely be equalled. Some idea may be formed of the difficulty of this pursuit, when it is stated that a Laplander, in chase of one of these animals, has been known to creep on his hands and knees through shrubs and moss, for nearly five miles, before he could approach within gun-shot of his prey. The various modes in which rein-deer are pursued, are too numerous and too intricate to require a detail in this place. It may be sufficient to say that they are assailed by dogs, traps, pitfalls, snares, cross-bows, and fire-arms, in all the ways which the inventive art of man can devise.

83. *The STAG, or RED DEER* (*Cervus elaphus*, Fig. 9), is a large species of deer, generally of reddish brown colour on the upper parts of the body, and white beneath; with large and much branched horns, rounded through their whole length.

The males only are horned. The male is called stag, or hart, the female hind, and the young one has the name of fawn.

Red deer are still found in the mountainous parts of Scotland; in the forest of Martindale, Cumberland; in the New Forest, Hampshire; in woods on the river Tamar, in Devonshire; and amongst the mountains of Kerry in Ireland. On the Continent of Europe, and in several parts of Asia and North America, they are very common.

The hunting of these animals was formerly considered one of the most important occupations of the English nobility, and, during the Saxon Heptarchy, it was the privileged pursuit of the sovereign and his court. By the kings of the Norman line laws of the most sanguin-

nary description were enacted for the preservation of these the royal game, it being then deemed less criminal to destroy an individual of the human species than a beast of chase. Forests were enlarged for the shelter of wild animals, and for the more ample enjoyment of the diversion of hunting, at the expense of every principle of justice and humanity. Happily for us, the scenes of devastation which this pursuit occasioned have long ceased to exist; and those vast tracts of country which were once dedicated to hunting, are now, for the most part, applied to the advantages and comfort of man.

As, therefore, the breed of red deer is now chiefly preserved in this kingdom from motives of curiosity, rather than either an object of amusement or utility, we are indebted almost wholly to foreign countries for those parts of the stag which are important in a commercial, economical, and medical view. The *skins* are manufactured into an excellently soft, and somewhat yellow-coloured leather, which is useful for numerous purposes. Many very extraordinary medicinal virtues were formerly attributed to the *horns* of the stag, and indeed to nearly all parts of its body: but the experience of late years gives no countenance to them. The horns are of nearly the same nature as bones, and the preparations of them, by heat, are similar to those of solid animal substances in general. Consequently the articles denominated *spirit of hartshorn*, and *salt of hartshorn*, though formerly obtained only from the horns of different species of deer, are now chiefly prepared from bones. The former of these, which is a volatile alkali of very penetrating nature, is an efficacious remedy in nervous complaints and fainting fits; and salt of hartshorn has been successfully prescribed in fevers. The scrapings or raspings of the horns, under the name of *hartshorn shavings*, are variously employed in medicine. Boiled in water, the horns of deer give out an emollient *jelly*, which is said to be remarkably nutritive. *Burnt hartshorn* is employed in

medicine. The horns of the stag are used by cutlers and other mechanics for the handles of knives and for cutting instruments of different kinds. The *flesh* of every species of deer has the name of *venison*; that of the young red deer is very delicate eating, that of the female is by no means bad, but that of the full-grown stag has a strong and disagreeable flavour.

These animals generally live in herds that consist of females, with their offspring, headed by one male, and they inhabit the wildest and most unfrequented parts of forests, browsing on grass, and on the leaves and buds of trees. They have a penetrating sight, and an exquisite smell, and are always on guard against the approach of danger. Their disposition, when unprovoked, is mild and peaceable; but if attacked, they prove extremely formidable opponents. The females produce their offspring (generally one each) about the end of May, or the beginning of June.

84. The FALLOW DEER (*Cervus dama*, Fig. 10) is a considerably smaller animal than the stag, generally of brownish bay colour on the upper parts of the body and whitish beneath, with branched horns, bent backward, compressed and broad at their extremity.

The males only are horned. The male of the fallow deer is called buck, the female doe, and the young one fawn.

Common as these animals are in parks throughout every part of England, they are not found wild in this country. They, however, inhabit various forests of the Continent, even as far as the south of Persia.

There is no species of food in more general request by epicures and *bon-vivans* than the *venison* of the fallow deer. This, when properly dressed, is an excellent aliment, and easily assimilated to the human fluids; but when half putrid, as is generally the case, it is considered very detrimental to health. The best season for killing the *bucks* for venison is from about the first of July to somewhat later than the middle of September; and that for the *does* is from about the middle of November to the middle of February.

The does produce one, sometimes two, and rarely three young ones each, about the beginning of June: these, for the first year, are called by the park-keepers *fawns*, if, during that time, they have no horns; the second year, if the young one be a male, it is called a *pricket*; in the third year, a *sorel*, and in the ensuing year, a *sore*; when he attains his fifth year he has the name of *buck*, and is accounted fit to be killed; but if he be suffered to live a year or two longer, he will improve both in flesh and fatness. If the young one be a female it is called during the first year, a *fawn*, during the second a *teg*, and, after that, it takes its proper name of *doe*. Such does as are intended to be killed in their season are either what have had no fawns in the preceding summer, or have had these killed and taken away.

The *horns* of fallow deer are used for all the same purposes as those of the stag (83); and their hides, under the name of *buck-skin* and *doe-skin*, have long been celebrated for their softness and pliability; and the manufacturing of them into breeches and gloves affords subsistence to a very numerous and industrious class of people.

Extensive herds of fallow deer associate together in large parks. These animals are less savage than red deer, yet when offended they often become ferocious. They feed on several kinds of vegetables, and on the leaves, bark, and young branches of trees; many of which, particularly hollies, are cut down, by park-keepers, in the severe weather of winter, for their subsistence.

85. The ROE or ROE-BUCK (*Cervus capreolus*) is a small species of deer, not more than two feet and half high at the shoulder, of reddish brown colour, which has short erect horns, divided towards their extremity into two or three points.

The males only have horns.

Small flocks of these animals are found wild in several of the mountainous districts of Scotland, and also in the mountainous

woods of Germany, Switzerland, and other parts of the continent of Europe, as well as in those of North America.

In some countries the *venison* of the roe is esteemed, during the proper season, equal to that of any other species of deer. There is, however, a great difference in it, according to the country in which the animals have fed, and the different races or varieties of the animals themselves. The flesh also of the bucks which have passed their second year is said to be tough and not well flavoured, whilst that of the does, though of much greater age, is tender. Those animals that are fed in parks, plains, and valleys, are also greatly inferior to such as have resided among mountains.

In America the *skins* of roes are an important object of commerce. They are very light, and are capable, for some time, of resisting the effects of moisture. Of these skins the American Indians make bags or bottles, in which they are able to keep oil, honey, butter, and other similar substances. They are also converted into clothing, and are sometimes dressed as furs, but the hair soon falls off. The *hair* itself is valuable for the stuffing of horse-collars and saddles, and it has the advantage of not becoming knotty like that of the ox. The *horns* are used in making handles for knives and for other purposes.

86. The CHAMOIS (*Antilope rupicapra*, Fig. 11) is a kind of antelope about the size of a goat, with short, erect, round, and smooth horns, which are hooked backward at the tips.

Its colour is dusky yellowish brown on the upper parts of the body, with the cheeks, chin, throat, and belly, yellowish white. The horns, which are common to both the sexes, are generally about eight inches in length, but shorter in the female than the male.

These animals inhabit many of the mountainous parts of Europe, particularly the Alps and Pyrenees.

There are few pursuits more arduous and difficult than the hunting of the chamois. Being wholly confined to rocky and mountainous situations, dogs are

nearly useless in it; and such are the sagacity and acuteness of perception of these animals, that they take alarm at the most distant approach of danger, and the stratagems which are practised to come within gun-shot of them are almost innumerable. They associate in flocks consisting of from four or five to nearly a hundred in number; and, when alarmed, they are able to spring, at a single leap, up rocks the perpendicular height of which is more than twenty feet, and in this case, by a few bounds, they throw themselves entirely out of the reach of their pursuers. If hard pressed, they will sometimes turn upon the hunter and attack him with fury; and instances have been related of men, thus attacked, having been thrown down precipices and destroyed by them.

The chief objects of this pursuit are the *flesh* and the *skin*. The former is, in general, a nutritious and wholesome food, and the latter is useful in numerous ways. When dressed, it forms a soft, warm, and pliable leather, which has the name of *shammoy*, and is manufactured into breeches, vests, and gloves, that are very durable and are much used by the labouring classes of people on the Continent. Of late years, however, the art of tanning has been brought to so much perfection, that excellent shammoy leather is made from the skins of the goat, the sheep, and the deer. The *horns* of the chamois are often cut into heads for canes, and the farriers of the Continent sometimes sharpen and use them for the bleeding of cattle. The *blood* of these animals is used medicinally, and, in Switzerland, is a celebrated nostrum for the cure of pleurisy and some other complaints.

87. The COMMON ANTELOPE (*Antilope cervicapra*, Fig. 12) is a quadruped distinguished by having spiral, round, and expanded horns, each marked with a great number of prominent rings; and the body of a brown colour, clouded with whitish and dusky shades and marks.

It is found in several parts of Africa and India.

One mode of hunting these and some other species

of antelope is by the hunting leopard and the ounce, but the most frequent mode of killing them is with guns.

Their *skins* are sometimes dressed with the hair on, and sometimes as leather; and the *flesh* constitutes an excellent kind of venison. The *horns* are convertible to nearly all the same purposes as the horns of the different kinds of deer; and they are also occasionally used as weapons.

38. The COMMON GOAT (*Capra ægagrus*, Fig. 13) is distinguished by having hollow, compressed, and rough horns, which grow first upright, and then bend backward.

Both the male and female are horned.

These animals are found wild in many of the mountainous countries of the European continent, of Africa, Persia, and India.

In many parts of Europe the goat is an animal essentially serviceable to the necessities and the comforts of mankind; affording even during its life, though fed on the most barren and uncultivated grounds, an abundant supply of milk and cheese.

Goats' milk is not only considered to be thicker, but to have a richer flavour than that of the cow; and, in some situations, especially on ship-board, where the goat thrives better than any other animal, it is peculiarly valuable. This creature eats readily every sort of refuse vegetables, and is kept at little expense. In a medicinal view goat's milk is an useful substitute for that of asses. It is of very peculiar nature, as its oily and coagulate parts do not separate spontaneously; they throw up no cream, and yield scarcely any butter. But this milk affords a very large proportion of cheese. Hence, in Switzerland, and other mountainous countries best adapted to the pasturage of goats, cheese is the chief produce of the dairies.

The flesh of the goat, when full grown, is rank, hard, and indigestible; yet, in some countries, it is eaten both in a fresh and salted state. That of the kid is

peculiarly rich, and, by many persons, is considered even preferable to lamb.

When properly tanned, the *skin* of the goat is manufactured into gloves and other articles of dress. There is a way of preparing these skins by maceration; so as to separate the surface or grain from the coarse under parts, after which they are dyed of various colours for different uses.

Morocco leather is chiefly made from the skins of goats, tanned and dyed in a peculiar manner. The manufacture of this leather was originally invented in the kingdom of Morocco, whence it has its name. The colours that are chiefly communicated to it are red and yellow, the former of which is produced by cochineal, and the latter by a yellow kind of berries. Morocco leather is also dyed black, green, and blue. Until within the last few years, the consumers of this kind of leather in England have depended wholly on a foreign supply: there are now, however, several manufactories of it in the neighbourhood of London, from which the most beautiful moroccos may be had at prices that have superseded the necessity of importing it from abroad. For leather of inferior quality, and particularly for such as is to receive a yellow colour, sheeps' skins are often substituted. The reason why goats' skins have been principally adopted for the manufacture of morocco is, that they take the dye better, and that they are susceptible of richer and more beautiful colours, than those of any other animals.

Goat-skins, as well as the skins of sheep, are sometimes made into parchment. The *skins of kids* are thin and of beautiful texture; they are consequently well adapted for ladies' gloves and shoes. On the Continent they are made into stockings, bed-ticks, and sometimes into hangings for beds, into sheets, and even into shirts.

Although the *fleece* of the goat is by no means so valuable as that of the sheep, yet it has been found extremely useful. The long and shaggy coated goat,

which is bred in many parts of this country, has, at the roots of the long hair, a fine and beautiful soft wool. The latter, though scarcely known to our manufacturers, has long been used in Russia for gloves, stockings, and other articles of dress, which are highly valuable. About a pound of this wool, in an unsorted state, was, some years ago, sent from Russia to be made into shawls. As the quantity was too small to admit of being manufactured into a web by itself, the chain was formed of silk, and the woof of yarn made from the goat's wool. The fabric, when completed, was compared with the finest Indian shawls; and, notwithstanding the hardness of the silken part, it was decidedly more soft and beautiful than any of these. Of the above-mentioned small quantity of wool three full-sized shawls and one waistcoat were made. Their colour was a dull white, with a delicate and scarcely perceptible glance of red through it; and their texture was so much admired, that Dr. Anderson, to whose care they were consigned, states, that if a hundred of them had been offered for sale, they would have produced at least twenty guineas each.

The *long hair* of goats, particularly that of the males, is used by peruke-makers, for lawyers and judges' wigs. Previously to its being used, it goes through several processes of preparation. The fine hair of kids is sometimes employed in the manufacture of hats. Goat's hair is occasionally made into a strong and coarse kind of cloth.

Of the *horns* of these animals the country people make handles for tucks, and knives of different kinds. The *fat* or suet, which, in general, is very abundant, may be made into candles, which, in whiteness and quality, are greatly superior to those of the best tallow of the sheep and ox.

Goats are active and mischievous animals, of hardy nature, which delight in rocky and mountainous situations. They are sometimes very injurious to young plantations, from their propensity to peel and destroy

the trees. The females usually have two, sometimes three, and rarely four young ones at a birth; and, in our climates, the duration of their life is said not often to exceed eleven or twelve years.

89. The hair of the ANGORA GOAT is long, soft, and silky, and is one of the most beautiful substances with which we are acquainted, for the manufacture of shawls, and other fine stuffs; and these, which in England have the name of *camblets*, are sometimes sold at very high prices. It is supposed that, with attention, Angora goats might be successfully and advantageously bred in Great Britain; particularly in those parts where the country is mountainous, and where the climate and food might not be far different from those of their native country of Asia Minor.

90. The COMMON SHEEP (*Ovis aries*, Fig. 14) has, in general, hollow, compressed, transversely wrinkled, and somewhat crescent-shaped horns; but some of the varieties are entirely destitute of these weapons.

The male is called ram, the female ewe, and the young one has the name of lamb.

Sheep are found in nearly every country of the world.

The bodies of these animals, in temperate and cold climates, are clad with a curled and closely matted kind of hair, which has the peculiar appellation of *wool*. The distinguishing characteristic of wool is that, when even the coarsest sort is manufactured into cloth, it thickens in the milling, and forms a close texture, owing to the peculiar roughness of its surface, and to its curly form; whereas the finest possible hair, under the same operation, will neither thicken nor form any texture whatever. It is by the manufacture of wool into various kinds of clothing that many thousands of people, in different countries of Europe, are entirely supported and fed. In temperate countries the fleeces of sheep are shorn or cut off once, and in others, where the climate is warmer, twice in the year, the animals being previously well washed to cleanse the

wool. The Shetland sheep, and some others, have the fleecé pulled, and not cut off.

When wool is intended to be manufactured into cloth of mixed colours, it is dyed in the fleece before it is spun. When intended for tapestry, it is dyed after it is spun; and when to be wrought into cloth of uniform colour, it is not dyed until the cloth is made.

Much wool is used in the manufacture of hats. For this purpose it goes through a process called *felting*, to unite or mat it into a firm substance. Felt is either made of wool alone, or of a mixture of wool with camel's or other hair.

The *skins* of sheep, after the processes called tanning and currying, are manufactured into a thin and coarse but useful kind of leather, which is much in request by saddlers, book-binders, and others. These skins, by a different process, are converted into *parchment*, which is used for writing deeds upon. Lambs' skins are made into gloves.

Every part of the sheep is advantageous to mankind. The flesh, under the denomination of *mutton*, supplies us with a wholesome and palatable food, which is in greatest estimation when the animals are at least three, and not more than six years old. That of lambs, in the spring of the year, is also in considerable demand. *House lamb* is so denominated from the animals being fattened within doors; but this kind of food is neither so wholesome nor so nutritive as the meat in a natural state. *Suet* is a solid kind of fat which is found in various parts of the bodies (particularly about the kidneys and intestines) of sheep, oxen, and other ruminating animals. It differs materially from fat or grease, as the latter remains soft, and this hardens in cooling. Suet is used for culinary and other purposes, and very extensively in the making of candles. The *milk* of sheep is rich and nourishing, and in great esteem among the peasantry of all countries where these animals are bred. It produces an abundance of butter, but this is so unpalatable as seldom to be eaten. Ewes' milk yields a large

proportion of strong and tough cheese. Of the entrails of sheep are made the strings generally called *cat-gut*, which are used for different kinds of musical instruments, and for the coverings of whips. Handles of knives, and several other useful articles, are made of the *bones* of sheep; the refuse parts of which are coarsely ground to serve as manure. A very important advantage is in another respect derived from these animals, by folding them upon land on which corn is afterwards to be grown.

There are, in Great Britain, many different breeds of sheep, some of which are very valuable.

91. Those called LEICESTER SHEEP are chiefly bred in that and the adjacent counties, and are much esteemed for their property of readily fattening. Their *mutton*, when in perfection, has a fineness of grain and a superiority of flavour beyond that of almost every other kind of sheep. These animals are capable of being rendered so fat, that, in some instances they have measured more than six inches deep in solid fat on the ribs. But, in this case, the mutton is scarcely eatable.

92. A coarse *wool*, but so long as to measure from ten to more than eighteen inches, is obtained from the breed called LINCOLNSHIRE SHEEP.

93. For united excellence of *wool* and *mutton* the SOUTH DOWN SHEEP are in great demand. This breed, which particularly abounds on the dry and chalky downs of Sussex and other southern parts of England, has of late been dispersed over nearly the whole kingdom. The animals are distinguishable by their grey or speckled face and legs, and being destitute of horns.

94. From the RYELAND or HEREFORDSHIRE SHEEP is obtained a peculiarly short, soft, and fine *wool*, which, if the filaments were of equal thickness and quality throughout, would be as valuable as the best wool that

we import from Spain. The *mutton* of these sheep is also fine-grained and of excellent flavour.

95. A breed of sheep, which is well known in Northumberland by the name of CHEVIOT SHEEP, produces very admirable *mutton* and *wool* of fine texture. Of the *milk* of these sheep great quantities of cheese are made, which is sold at a low price. This, when three or four days old, becomes very pungent, and is in considerable esteem for the table.

96. The SHETLAND islands produce a kind of sheep so small as seldom to exceed the weight of thirty or forty pounds. Their *wool* is sufficiently soft to be adapted even to clothing of the most delicate texture. A pair of stockings that were made of it were so fine as to be sold for six guineas. The *skins* of these sheep with the fleece on are capable of being converted into a fur of great value; and, when the wool is stripped from them, they are, as leather, peculiarly estimable for aprons, and are purchased by mechanics for this purpose at double the price of other skins of the same size.

97. It is to the breed called DORSETSHIRE SHEEP that the London markets are principally indebted for the *house-lamb*, which, at an early part of the season, bears so high a price. After the lambs are produced they are confined in small dark places, and never see the light, except when brought out to be fed by the ewes; and, at the times when thus brought out, their cabins are cleansed, and littered with fresh straw, as a great part of their value depends upon the cleanliness in which they are kept.

98. The *mutton* of the HEATH SHEEP, a breed which is found in most of the north-western parts of England, and even as far as the western Highlands of Scotland, is accounted peculiarly excellent; and immense numbers of these sheep are annually sold at the north country fairs. The animals themselves are hardy

and active, and well adapted to subsist in healthy and mountainous districts.

99. *MERINO SHEEP* are a celebrated Spanish breed of sheep, with small horns, white face and legs, small bones, a loose skin hanging from the neck, the wool fine, the external part of the fleece dark brown in consequence of the dust adhering to it, the interior delicate white, and the skin of rosy hue.

The celebrity of this breed, for the production of a remarkably fine wool, has been such, that all the highest priced cloths manufactured in this country, until of late years, were made of Spanish wool. In the year 1787 some of these sheep were first introduced into England. And, although it was formerly a prevailing opinion that the excellence of their fleece depended, in a great degree, upon the temperature of the Spanish climate, it has been satisfactorily ascertained that the fineness of Spanish wool is not in the slightest degree impaired by breeding the sheep in this country. Even in Hungary sheep of this kind have, for many years, been so successfully reared, that much of the fine wool used in our clothing countries has been imported from thence. The average weight of the Merino fleece is about three pounds and half. It has lately been a great object of attention in England to improve our own breeds, particularly the Ryeland, by a mixture with merinos, and this cross breed is stated to retain all the principal characteristics of the Spanish race. The *matton* of these sheep, for size and flavour, is much in demand, and sells in the market at a higher price than that of most other kinds of sheep.

100. *The BROAD-TAILED SHEEP* are a very remarkable kind of sheep, distinguished by their tails being extremely large, and so long as sometimes to drag upon the ground.

They are found in several parts of Persia, Syria, Egypt, and other eastern countries.

The *tails* of these animals are almost wholly composed of a substance resembling marrow, and sometimes they are equal in weight to one-third of the whole

carcase. To prevent them from chafing against the ground, the shepherds not unfrequently put boards, with small wheels, under them, attached to the hinder parts of the animal. The substance of these tails is in great demand, instead of butter, for culinary purposes; and it forms an ingredient in several kinds of dishes. The *fleece* of the broad-tailed sheep is peculiarly long and fine, and, in Thibet, is manufactured into shawls and other articles of peculiarly delicate texture, which form a considerable source of wealth to the inhabitants.

Of these, and of another kind of sheep called *Tartarian* or *fat-rumped sheep*, the hinder parts of which are so excessively fat as entirely to enclose the tail, there are great numbers bred in Tartary. It is even stated that, on an average, 150,000 of them are annually sold at the fairs of Orenburgh, and a much greater number in some other places.

101. *The COMMON OX* (*Bos taurus domesticus*, Fig. 29) is characterised by having rounded horns which curve outward, and a loose skin or dewlap beneath the throat.

The male is called bull, the female cow, and the young one calf.

This animal, in a wild state, is the bison (Fig. 15) which is found in the marshy forests of Poland and Lithuania.

It is almost impossible to enumerate all the benefits that mankind derive from these admirable animals. In many countries nearly the whole labour of agriculture is performed by oxen, and, after this service is over, they are fatted and slaughtered for food. It is well known in what estimation they were formerly held in Egypt; they furnished even deities to the superstitious inhabitants of that country. From their supplying the Gentoos with milk, butter, and cheese, their favourite food, those people bear for them a veneration so great that nothing on earth would induce them to slay one of them.

In nearly all eastern countries oxen are employed in treading out corn. By the Caffres of the Cape of

Good Hope they are used as beasts of draught and burden. When Mr. Barrow and his suite went into the country of the Caffres, the king, who was at a distance from his usual residence, was sent to; and he is stated to have arrived riding upon an ox full gallop, attended by five or six of his people.

To the *milk* of the cow we are indebted for several important articles of human subsistence. It is adapted to every state and age of the body, but particularly to the feeding of infants after they have been weaned. Skimmed milk, or that which remains after the cream has been taken off, is employed, in considerable quantity, by wine and spirit merchants, for clarifying or fining down turbid white wine, arrack, and weak spirits.

Nearly all the *cheese* that is consumed in the British islands is made of cow's milk. For this purpose the milk is curdled by mixture with a substance called rennet, which is prepared from the inuer membrane of a calf's stomach; and the curd, thus formed, after being cleared of the whey or watery part contained in the milk, is collected together, pressed, and dried for use.

The richest of all the English kinds of cheese is that called *Stilton cheese*. This, however, is not, as its name would import, made in the town of Stilton, but in various parts of Huntingdonshire, and in Leicestershire, Rutland, and Northamptonshire. Stilton cheese is indebted, for its excellence, both to the rich pastures on which the cows are fed, and to the peculiar process by which it is made. It is not sufficiently mellowed for use until two years old, and is not in a state to be eaten till it is decayed, blue, and moist. To hasten the ripening of Stilton cheeses, it is not unusual to place them in buckets, and to cover these with horse-dung. *Cheshire* is famous for its cheese, which is generally much salter and more smart upon the palate than any other English kind. In *Wiltshire* and *Gloucestershire* much cheese of rich and excellent quality is made.

The neighbourhood of *Cheddar*, in the county of Somerset, produces a very admirable kind, which is little inferior in taste to Parmesan, and is supposed to owe its peculiar quality to the cows feeding in rich pastures, and particularly on the flote fescue grass (*Festuca fluitans*), with which many of those pastures abound. *Cottenham cheese* is a soft white cheese, for which we are chiefly indebted to a small village of that name situated a few miles from Cambridge. In the neighbourhood of *Bath* and *York*, and also in *Lincolnshire*, a rich and excellent kind of cream cheese is made. In Scotland a species of cheese is produced which has long been known and celebrated under the name of *Dunlop cheese*, from a parish of that name in Ayrshire, in the neighbourhood of which it is principally made.

Of foreign kinds of cheese the most celebrated is *Parmesan*. This is made of ewes' milk, or of a mixture of ewes' or goats' milk with that of the cow. We receive it from various parts of Italy, and also from other countries, although the name would import it to be made exclusively in the neighbourhood of Parma. In the district of *Gruyere*, a small town in the canton of Friburg in Switzerland, a well-known kind of cheese of large size is made, which goes by that name. *Gouda* cheese is famous in Holland. The common *Dutch cheeses* are of globular shape, and each three or four pounds in weight. They are prepared in the same manner as Cheshire cheese, with the exception that, instead of rennet, the Dutch use spirit of vitriol (sulphuric acid). Hence this kind of cheese has a sharp and saline taste, which is said to exempt it from the depredations of mites. *Green Swiss cheese* has a strong and peculiar flavour derived from the fragrant powder of melliot (*Trifolium melilotus officinalis*). This cheese is, however, to many persons, very disagreeable.

When milk has been suffered to stand a few hours, a substance called *cream* rises to the surface. This is skimmed off for several uses, but principally for the

purpose of being made into *butter*, which is done by beating it in a vessel called a churn. In Cheshire it is customary to churn the butter from the whole milk, without its being skimmed, but this is contrary to the practice in most other parts of England. The consumption of butter is so great that not less than 50,000 tons' weight of it are stated to be annually used in London only. That which is principally in esteem there is produced in Essex, and known by the name of *Epping butter*.

To make butter keep for a greater length of time than it would otherwise do, it is salted and packed in small tubs or barrels; and, in this state, it is a very considerable article of commerce. In the salting and packing of butter many abuses are practised, to increase its bulk and weight, against which there is an express act of parliament. Lumps of good butter are sometimes laid, for a little depth, at the top of a barrel, with butter of inferior quality beneath it. Sometimes the butter is packed hollow; and sometimes the exterior part of the butter is good whilst the whole interior is bad.

After the butter has been separated there remains in the churn a kind of whey which is called *butter-milk*, and the quality of which greatly depends on the manner of churning. Before it turns sour, *butter-milk* is a favourite beverage in the families of some farmers. It is also occasionally used as a wash for the face, being considered a remedy against freckles; but it is principally applied for the feeding of pigs.

The flesh of oxen constitutes the kind of food which we call *beef*. This is usually eaten in a recent state, but is sometimes, particularly in the northern parts of England, in Ireland, and Holland, salted in the manner of bacon, and in this state, it is a considerable article of trade. It affords a strong and invigorating nutriment, superior to any that we are acquainted with. *Beef-tea* is a preparation commonly made for invalids and convalescents, and consists of an infusion

of the lean parts of beef in boiling water. *Veal*, or the flesh of calves, is an highly esteemed and delicate food.

The *skins* of cattle, after they have undergone the processes of tanning and currying, are employed for making harness, saddles, bridles, the soles of shoes, and for various other purposes. *Calves' skins* are used for the upper leathers of shoes, and by saddlers, book-binders, &c. The skins of sucking calves are manufactured into *vellum*, a thin substance which is employed by book-binders; also for writing and drawing upon, and for other uses. From the parings and other offals of the hides of oxen, and the parings and scraps of the legs, by boiling them in water to the consistence of a jelly, straining them through a wicket basket, suffering the impurities to subside, and then boiling them a second time, is made *glue*. This, in a state of jelly, is poured into flat frames or moulds; when congealed, it is cut into square pieces, and afterwards dried, by being suspended in a coarse kind of netting.

The *leg-bones* of oxen, after having been whitened by boiling them with quick-lime, are used in the manufacture of the handles of knives and forks, and for innumerable other purposes. This substance, when good, is nearly allied to ivory: but is easily distinguished by its porous nature, its coarse grain, and its wanting the beautiful white veins which are so conspicuous in ivory. Bones, after having been burnt or calcined, are used by the refiners of gold and silver.

The *horns* of oxen are used for many of the same purposes as bone. After having been softened by heat they are capable of being moulded into almost any shape. They are sometimes stained in such manner as to imitate tortoise-shell, and they are then used for the making of combs. By a peculiar process they are rendered semi-transparent, and, when formed into thin plates, are employed instead of glass for lanthorns. Horn was the first transparent substance that was ever used for lanthorns and windows.

Tallow is the fat of sheep and oxen, cleared of its fibrous parts by straining and other management. It is further improved and clarified by the addition of alum, and, in this state, is used for the making of candles. Tallow is also a chief ingredient in soap. From the feet of oxen is procured a kind of oil, called *Neats-foot oil*, which is of great use in the preparing and softening of leather. The *blood* is employed in the clarifying of sugar, and great quantities of it, during the late war, were exported from London to Sweden for this purpose. The skins of the intestines are used for beating gold leaf betwixt; and these, under the name of *gold-beaters' skin*, are afterwards considered efficacious as an adhesive plaster for healing small wounds. Of gold-beaters' skin the French manufacturers of toys sometimes construct little balloons for the amusement of children. A few years ago there was, in London, an exhibition of animals formed of this substance and inflated with air.

102. British cattle are considered preferable to the cattle of any other country in the world. Those called **DEVONSHIRE CATTLE**, which are distinguished by their mahogany colour and light yellow horns, are adjudged to be the best of any. They are much used in agricultural labours, being peculiarly fitted for draught both by their hardiness and activity. The *beef* of this breed is peculiarly excellent. Their *skins* are thin, but improve much in tanning; and the *tallow* is of peculiarly good quality.

103. In the northern parts of England there is a very useful kind, called **HOLDERNESS** or **DUTCH CATTLE**. These, in size and weight exceed all the British cattle. The cows have great celebrity for yielding a very extraordinary quantity of *milk*; instances have been mentioned of their yielding thirty-six quarts in a day. This stock is well known in the neighbourhood of the metropolis, being that which is generally kept by the London cow-keepers. The animal exhibited in London

in the beginning of 1802, under the name of the "wonderful ox," was a variety produced from this breed, and weighed more than 200 stone.

104. The LANCASHIRE or LONG-HORNED CATTLE, are much esteemed for the dairy. The cows yield from sixteen to twenty-four quarts of *milk* per day; and, on an average, about 300 weight of cheese per annum. They are hardy animals, readily become fat, and produce remarkably well-flavoured *beef*. But they are chiefly celebrated for the thickness and substance of their hides, which are very valuable, and sell at high prices. In many instances the *hides* have been known to produce a greater price per pound than the *beef*.

105. ALDERNEY CATTLE are a favourite breed, that have long been known and esteemed, in the southern counties of England, for their *milk*, which is richer than that of any other breed. These animals are of small size, the cows seldom exceeding the height of four feet; yet they are known to produce so much milk as to yield from 200 to more than 300 pounds' weight of butter per annum. In the islands of Guernsey, Jersey, and Alderney, where these cattle are chiefly bred, they are sometimes employed in ploughing; but their greatest use is in carting, and, in this respect, they are found to answer peculiarly well in bad roads and hilly countries. Their *beef* is generally yellow or very high coloured; but it is peculiarly fine in the grain, and of excellent flavour.

106. Scotland is famous for a small kind of black cattle, with fine white upright horns tipped with black, called HIGHLAND STOTS, or KYLOE CATTLE. Having great celebrity for the fineness and sweetness of their *beef*, as well as the facility with which they are fattened, these cattle are in such esteem as to be driven into the southern counties of England, and occasionally to supply even the London markets. The cows, in proportion to their size, yield a great quantity of rich milk.

107. The *YAK*, or *GRUNTING OX* (*Bos grunniens*), is an animal of large size, with round, upright, and slender horns, a lump on the shoulders, long and pendant hair, white on the back and tail; and the tail somewhat resembling that of a horse.

In a wild state this animal is an inhabitant of the mountains of Thibet.

With the oriental princes the white tails of the yak are of great value for military standards; and the use of them is very ancient. These tails are also employed, in many parts of the East, to ornament the trappings both of elephants and horses; and, when mounted on a silver handle, they are used by the principal men of India as a brush to chase away flies. The Chinese dye the hair of a red colour, and form tufts for their caps of it. Many beautiful kinds of stuffs are woven of a fine wool which these animals have next to their skin.

108. The *MUSK OX* (*Bos moschatus*) is a North American animal of small size, with horns broad, and approaching each other at the base, bent downward, and the tips upward and pointed; a protuberance on the shoulder, and the body covered with long silky hair of a dusky red tinge.

To the North American Indians the musk ox is an animal of considerable importance. Its *flesh* furnishes them with an useful food, which, though it has a musky flavour, is not on that account the less esteemed. This flesh, in a frozen state, is also an article of traffic, with the British and American forts, during winter.

At the roots of the long hair of the musk ox there is a peculiarly beautiful ash-coloured *fleece*, which is finer and softer than silk, and may be wrought into very elegant articles of dress. It is of the long hair of these animals that the Esquimaux Indians make those caps which give them their very extraordinary appearance, by the ends being contrived so to fall down over their face, as to protect them from the bites of musk-toes. The *skins* are convertible into leather, and are

also frequently used, by Indians, with the hair on, as coverings of various kinds.

109. *The AMERICAN BISON* (*Bos Americanus*) is a large species of ox, with round and distant horns which point outward, a long and woolly mane, and a large fleshy protuberance on the shoulders.

These animals inhabit, in immense herds, the savannahs and marshes of the interior of North America.

As they are capable of being domesticated, and, in this state, are sufficiently tractable for the purpose, they are sometimes rendered useful for agricultural labours. The hunting of the wild bison is a common and very arduous employment of the natives of the interior of America, particularly those living adjacent to the rivers Mississippi and Ohio. The *flesh* of these animals is used as food, and the fatty protuberance on the shoulders is esteemed a great delicacy. The *tongues*, which are reckoned superior to those of oxen, are frequently transported to New Orleans, where they always have a ready sale. When the animals are quite fat they are said to yield sometimes as much as 150 pounds weight of *tallow* each. The latter is so important an article of commerce, that, in many instances, the hunters cut out only the tongue and tallow, leaving the remainder of the carcass to be devoured by wild beasts. Powder-flasks are made of the *horns*. The *skins* are capable of being converted into an excellent buff leather; and, when dressed with the hair on, the lighter skins serve the Indians as beds, and for clothes, gloves, and shoes. Some persons use them as blankets, and find them a very warm and pleasant covering. The *hair* is spun and woven into various articles of clothing, which are both durable and useful, and are peculiarly soft and pleasant to the wearer.

110. *The BUFFALO* (*Bos bubalus*) is a species of ox, which has large horns of compressed form, with the outer edge sharp, growing straight for a considerable length from their base, and then bent slightly upward: on the shoulders there is a bony

protuberance; and the general colour of the hair is black or dusky.

In a wild state these animals are natives of Asia and Africa; and they are domesticated in India, and in some of the warmer parts of Europe.

Although the buffalo is naturally a savage and ferocious beast, yet, when properly trained, it is very serviceable to mankind. These animals are used both for draught and burthen, and are sometimes even trained for the saddle. They are guided by a cord attached to a ring, which is made to pass through the cartilage of their nose. Two buffaloes, harnessed to a carriage, are considered able to draw as much as four horses.

The *milk* of the buffalo, though not so good as that of the cow, is in greater quantity, and in much esteem. *Ghee* is a kind of butter made from the milk of these animals, and clarified. This is an article of commerce in various parts of India, and is generally conveyed in bags or bottles made of the hide, each of which holds from ten to forty gallons. The *flesh* is said somewhat to resemble beef, but to be of a darker colour: that of the calves is considered peculiarly delicate. Of the *skin* is made a strong and durable leather, which, under the name of *buff* leather, is applicable to a great variety of uses. The *horns* have a fine grain, are strong, and bear a good polish; and are, therefore, much used by cutlers and other artificers. They are occasionally imported into this country from Bengal.

These animals usually associate in large herds, in marshy and woody plains. So great is their ferocity that the hunters are at all times fearful of attempting to kill them, unless they are perfectly sure of their aim. They swim over even the widest rivers with a facility which can be equalled by few quadrupeds.

111. *The CAPE BUFFALO (Bos cafer) is an excessively strong and ferocious beast of the ox tribe, which has thick horns that are rugged at the base, and lie so flat as to cover almost all the top of the head.*

These animals are found in herds of a hundred and fifty or two hundred together, in the plains of Caffraria, and other parts of the south of Africa.

There are no animals of the ox tribe so savage, so much dreaded, nor so wantonly mischievous as these: they attack and destroy mankind without being themselves previously assailed, and commit devastations of the most alarming kind in the neighbourhood of the places where they are found. They are killed on account of their *flesh*, which is lean, but juicy and of high flavour; and also on account of their *hides*, which are so thick and tough that even musket-proof targets are formed of them. Of these hides also the strongest and best thongs for harness are made. The Hottentots, who are never inclined to take much trouble in dressing their victuals, cut the *flesh* off into slices, and then smoke, and at the same time half broil, it over a few coals. They also frequently eat it in a state of absolute putrefaction.

ORDER VI.—BELLUÆ.

112. *The HORSE (Equus caballus, Fig. 30) is distinguished from every other quadruped by having his hoofs single, and his tail covered with long hair.*

The male has the name of horse, the female of mare, and the young one of foal.

Wild horses are found, in large herds, in Siberia, and several other parts of Asia, as well as in some parts of Africa.

Endowed with the most useful qualifications; the horse is an animal of the greatest importance to the inhabitants of all temperate climates. Though naturally spirited, active, and intrepid, he submits with patience to carry burthens, and to toil, for days together, along roads and in agricultural labours. And, if treated with care and attention, he perseveringly adapts himself to our wants and conveniences. In some parts of Tartary these animals have even been made objects of divine worship, originating, no doubt, in a principle of gratitude for the services they perform.

By the Arabians they are nearly as much attended to and beloved as human beings: they live in the same tents with their owners, and participate in all the kindnesses which this people bestow upon their own families. In Arabia, indeed, they may be deemed the chief support of the families which possess them; and (surrounded with foes) the very existence of the owner not unfrequently depends upon the powers of his horse.

In no country of Europe is so much attention paid to the breeding and training of horses as in England. The consequence has been that the British horses are superior, both in swiftness of foot, and in strength and perseverance in the course, to any others in this quarter of the world.

The fleetest of all the *British horses* is, of course, the *race-horse*: and, for short distances, none of the Arabians, which have been tried in England, have proved in any degree equal to him. The celebrated horse called Childers, in the year 1721, ran four miles in six minutes and forty-eight seconds, carrying a weight of nine stone two pounds. Had the different racing meetings at Newmarket, York, and other places, no other view than to call together great concourses of people for amusement, their tendency would be injurious rather than beneficial to society; but when it is considered that such meetings are the cause of great emulation in the breeding of a race of animals so valuable as the horse, their utility will be sufficiently apparent.

The English *hunters* are allowed to be among the noblest, most elegant, and most useful animals that are known; and the value of our *hackneys*, or road horses, may be imagined when it is stated that many of them are able to trot at the rate of more than fifteen miles per hour.

So great is the strength of these animals, that instances have been mentioned of a single horse drawing, for a short space, the weight of three tons; and of

others carrying a load which weighed more than 900 pounds. The immense *dray-horses* that are employed by brewers, and are so frequently seen in the streets of London, though in some measure they are useful as being able better to sustain the shock of loading and unloading than slighter animals, are chiefly kept from a principle of ostentation. The British *draught-horses* are extremely valuable animals, but particularly a chesnut-coloured race called Suffolk-horses.

In *Scotland* there is a breed of small horses, or ponies, which are known by the name of *galloways*. The best of these seldom exceed the height of fourteen hands and a half,* and are uncommonly active, hardy, and spirited animals. The *Shetland Islands* produce a race called *shelties*, which, though exceedingly diminutive in size, are, in other respects, highly excellent.

In *Ireland* the cart-horses, though of sufficient size, are ill-shaped and bad. The saddle-horses appear naturally as good as ours; but, in general, they are ill kept, worse groomed, and still worse shod.

The *French horses* are extremely various in their kind; but few of them can be called fine. The best saddle-horses of France are produced in the vicinity of Limosin, and in Normandy. The latter, though not so valuable as hunters, are preferable to all the rest for war. Lower Normandy is famous for fine carriage horses. A prevailing fault in the horses of France is too great a width across the shoulders.

The *Dutch horses* are said to be very good for carriages; and great numbers of them are annually sent into France. The *Flemish horses* are far inferior to those of Holland. They have generally large heads and broad feet; and their legs are subject to dropsical swellings.

Germany affords some fine horses, but the generality of them are heavy and thick-winded. Those of *Hun-*

* Four inches make a hand. This is the usual mode of estimating the height of horses.

gary and *Transylvania*, however, are very light and fleet. The Hussars and Hungarians, it is said, adopt the cruel practice of slitting the nostrils of their horses, with a view to improve their wind, and prevent them from neighing in the field.

The *Danish horses* are so large in size, and so well set, that they were formerly preferred, as carriage-horses, to all others. They are extremely various in colour; and many of them are pyed and spotted, which is not the case with the horses of other countries.

In *Spain* the horses are very beautiful and excellent. They have a long thick neck, with a flowing mane. The head is large; the ears are long, but well placed; the eyes full of fire; the air noble and spirited; the shoulders thick, and the chest broad. They have great agility and stateliness. Their prevailing colours are black and light chesnut.

The *Italian horses* were formerly much finer than they are at present, the breeding of them having long been neglected. The kingdom of Naples, however, still affords fine horses, especially for carriages; but they have, in general, large heads and thick necks. They are also untractable, and consequently are difficult to be trained; but these defects are, in some degree, compensated by the largeness of their size, their spirit, and the beauty of their motions.

There is a prevalent and erroneous notion that the *flesh* of the horse is bitter and unpalatable. In several parts of Asia wild horses are killed almost exclusively for food; and the Calmuc Tartars, in particular, are so partial to this kind of flesh, that they seldom eat any other. Horses' flesh is constantly exposed for sale in the markets of Tonquin. A celebrated British writer (Dr. Anderson) has strongly recommended the fattening of horses as food in this country, and urges his recommendation by declaring that horse-flesh is superior in delicacy of flavour to beef!

The Tartars drink the *milk* of the mare, and also convert it into butter and cheese. One of their most

favourite kinds of beverage is called *koumiss*: it is a sort of wine made of fermented mares' milk; and is carried, by them, from place to place, in bags made of horses' hides. When in perfection, the taste of *koumiss* is said to be a pleasant mixture of sweet and sour; but it is necessary to agitate it before it is drunk. This preparation is also considered of great utility in a medicinal view.

The *skin* of the horse, after it is tanned, is made into collars, traces, and other parts of harness; and, under the name of *cordovan*, is also used for shoes. The *hair* forms a considerable branch of trade. That of the tail is employed for weaving the covers or seats of chairs and sofas; for making sieves, fishing-lines, and the bows of musical instruments. The inferior hair of the tail and mane is employed for the stuffing of bolsters and mattresses. For this purpose it is baked, by which it is rendered one of the most elastic substances, for couches, that are known. The short hair of the horse is used for stuffing saddles and horse-collars.

If horses be well treated, and properly attended to, they will sometimes live to the age of fifty years; but, during great part of this time, they are generally so decrepid as to be unable to perform any services whatever for their owners. To ascertain the age of a horse, reference is generally had to the teeth. Deeply sunk eye-pits are usually considered a criterion, though not an infallible one, of an old horse; and, for colts or young horses, attention must be paid to the appearance of their coat, and of the hairs of the mane and tail, as it is not until they have changed their first teeth that any correct judgment of their age can be formed from the mouth. The deceptions of horse-dealers in changing the appearance of the teeth, and in various other particulars relative to the horse, render great caution necessary in the purchase of these animals.

113. The *ASS* (*Equus asinus*) is characterized by his tail having long hairs only towards the extremity, and the male having a blackish cross over the shoulders.

Wild asses associate in herds in the mountainous deserts of Tartary, Persia, and India; and also in some parts of Africa.

This animal, which by care and attention, is rendered, in Spain and some other countries, an elegant, tractable, and valuable servant of man, is entirely neglected by us; and, in England, has consequently degenerated into a stupid and inactive beast. The Sacred Writings speak of asses being in general use throughout the Eastern countries, both for the saddle, and as animals of draught and burthen. With the Romans they were in such estimation that Pliny speaks of a male ass having been sold at a price which exceeded 3000*l.* of our money. In Spain the best asses are sold at very high prices, sometimes as much as 100 guineas and upwards each.

Doomed as it is with us to slavery and ill treatment, we cannot be surprised that the ass, in many instances, should appear a stubborn and intractable animal. But whenever it is well treated, it is remarkable for meekness, patience, and docility; it submits quietly to chastisement, is temperate in its food, and is contented to feed on such vegetables as most other animals would refuse. In proportion to its size, the ass is capable of supporting great fatigue, and of dragging and carrying heavy burthens. Asses are chiefly employed for drawing hucksters' earts, and similar burthens; and, if properly trained, there can be no doubt but they would constitute the cheapest team that could be used. Being more hardy than horses, these animals are preferred to them for journeys across the deserts of Asia. Most of the Musselmen pilgrims use them in their long and laborious journeys to Mecca. In the principal streets of Cairo, asses stand ready saddled for hire, and answer the same purposes as hackney coaches in London. The person who lets an ass accompanies him, running behind to goad him on.

Asses' milk is light, easy of digestion, and so nutritious as to be recommended in many disorders. It is

particularly agreeable to the tender stomachs of consumptive persons, is wholesome for young children, and is chiefly drunk whilst warm from the animals; there is a mode of preparing artificial asses' milk with eryngo root, pearl-barley, and liquorice root, boiled in water, and mixed with new cows' milk. In some parts of the Continent asses' milk is occasionally used as a cosmetic.

The *flesh* of the wild ass is so much esteemed in Persia that it is admitted even to the imperial table. The Persians have an adage expressive of their high opinion of it. Notwithstanding this, the flesh of the domestic ass is so bad as food, that it is said few persons would be able to eat of it. From their hardness and elasticity, the *skins* of these animals are capable of being used for various purposes. They are manufactured into shoes, heads for drums, and, when varnished over in a peculiar manner, are cut into leaves for pocket-books. The inhabitants of some of the Eastern countries make of asses' skin the substance called *sagri* or *shagreen*. At Astracan, and throughout Persia, there are great manufactories of this article. It is not naturally granulated; this roughness being altogether effected by art. Of the bones of the ass the ancients are said to have made their best sounding flutes.

114. The MULE, or mixed produce betwixt the ass and the mare, is a very hardy and useful animal. Its size is larger, its head and ears smaller, and its coat smoother than those of the ass. In countries where the breed of asses is sufficiently large for obtaining mules of considerable size, these are preferred to nearly all animals for cheapness, durability, and general convenience, as beasts of burthen. In England they have never been propagated to any extent; and the few that have been reared in this country have, in general, been the produce of such diminutive parents, as to exhibit only a puny race, by no means calculated for the services of which a well-managed breed would be capable.

Yet even these, where they have been used, have been found to possess many very estimable qualities. In the brewhouse of Messrs. Truman, Harford, and Co. of Limehouse, mules were for a little while used in place of the dray-horses which are employed by other brewers. Each dray was drawn by three mules, and carried three butts of beer, a weight precisely the same which the London drays carry with three large horses.

115. *The HIPPOPOTAMUS, or RIVER-HORSE* (*Hippopotamus amphibius*), is an African quadruped of immense bulk, with large head, extremely wide mouth, strong teeth, and thick and short legs, each terminated by four hoofs.

The body is of brownish colour, and covered with short and thinly set hair. One of these animals, which M. le Vaillant killed in the South of Africa, measured nearly eleven feet in length, and about nine in circumference.

In the immediate vicinity of rivers, in several parts of Africa, even as far south as the Cape of Good Hope, the hippopotamus is occasionally seen. Notwithstanding his bulk and strength, he is an animal of considerable timidity; and whenever he is surprised, he plunges into the water, and walks about at the bottom with great ease, rising to the surface about once every ten minutes to breathe. He feeds on plants of various kinds, and sometimes proves very destructive in the plantations, not only by the quantity of food which he devours, but also by treading down and crushing with his feet much more than he eats.

The hippopotamus is one of those animals whose tusks are used as ivory; and, from their always preserving their original whiteness and purity, they are considered superior to the tusks of the elephant. They are each from twelve to fourteen inches in length, and weigh from six to ten pounds. Dentists sometimes manufacture them into artificial teeth, for which they are well adapted. Of the hide, which in some parts is nearly two inches thick, the inhabitants of Africa make excellent whips, which, after a little use, become very pliable.

The *flesh*, when the animals are in good condition, is said to be tender and well flavoured, particularly that of the parts near the breast. It is even sometimes admitted to the tables of the colonists at the Cape of Good Hope. The Hottentots consider it so great a delicacy that they eat it even in an half putrid state. Professor Thunberg states, that he one day passed a Hottentot's tent, which had been pitched for the purpose of consuming the body of an hippopotamus that had been killed some time before; and says, that the inhabitants of the tent were in the midst of such stench, that the travellers could hardly pass them without being suffocated. The *feet* are considered peculiarly fine eating; and the *tongue*, when salted and dried, is in great esteem at the Cape.

116. The HOG (*Sus scrofa*, Fig. 16) is distinguishable by its prominent tusks, the flat termination of its snout, its feet being cloven, the fore part of its back being bristly, and the tail hairy.

The male is called boar, and the female sow. The appellations of swine and pig are given to the whole breed, though the latter is more peculiarly applicable to the young animals.

The parent stock of our domestic swine is the wild boar, which inhabits the forests of France, Germany, and other parts of Europe, as well as those of Persia and India.

Wild boars usually live in families, and are hunted, as an amusement, in all the parts of the world where they are found. The *flesh* of the wild animals, if they are not old, is said to be much superior to that of our domestic swine. That of the young ones is peculiarly delicate. Of an old wild boar the head only is eatable.

The advantages derived from the breeding of swine are very great. Their flesh, which has the appellation of *pork*, is in universal request; and is of peculiar importance in a commercial view, as it takes salt better, and is capable of being kept longer, than any other kind of meat that we are acquainted with. Pork, after having been salted, is sometimes hung up to dry in the open air; but, generally, it is smoked by being hung in

a chimney. In this state it has the general name of *bacon*. What are called *hams*, are the thighs preserved in a similar manner. *Westphalia hams* are generally made from such animals as have been well fed, and allowed to range at pleasure in the extensive moorlands of that province; and they have a singular flavour, not so much from any great difference that there is in the salting of them, as from their being smoked in chimneys where only wood fires are burnt. The time of funigation is from three to six months, according to their size. Pork, though a wholesome food, requires a strong stomach to digest it properly; and ham and bacon are highly improper for persons of weak and languid habits. *Brawn* is the flesh of the boar pickled in a peculiar manner, and is always better tasted according to the greater age of the animal of which it is made. After the boar is killed, the head and legs are cut off, and the bones are carefully taken from the remaining part. This, after having been properly salted, is rolled together as hard as possible. It is then boiled till it becomes so tender as to be pierced with a straw. It is afterwards set by till quite cold, and lastly is immersed in a pickle formed of salt and bran boiled together. The usual mode of curing pork is with common salt, or bay salt; but some persons add saltpetre or nitre, juniper berries, pepper, and other antiseptic substances.

The Jews and Mahometans abstain from this species of food from a religious principle, and even consider themselves defiled by touching it. The inhabitants of China, on the contrary, are so excessively fond of pork, that multitudes, from this partiality alone, are said to have been prevented from conversion to Mahometanism.

The *fat* of swine differs, in its situation, from that of almost every other quadruped, as it covers the animals all over, and forms a thick, distinct, and continued layer betwixt the flesh and the skin, somewhat like the blubber in whales (118). It is called *lard*, and is applicable to various uses, both culinary and medicinal;

and particularly to the composition of ointments. The general mode of preparation is to melt it in a jar placed in a kettle of water; and in this state to boil it, and run it into bladders that have been cleansed with great care. The smaller the bladders are the better the lard will keep. The fat which adheres to the parts connected with the intestines differs from common lard, and is preferably employed for the greasing of carriage wheels. The *blood*, the *feet*, and the *tongue*, are all adopted for food.

The *skin*, when properly dressed, is used for the seats of saddles; by book-binders, and other artisans.

In China hogs' skins are much in request by shoe-makers. All the shoes that are sold to Europeans at Canton are made of hogs' leather, the hair having previously been burnt off with a hot iron. In our own country, when swine are killed for food, it is not customary to strip off the skin, but merely to rid it of the bristles, by scalding the animals, after they are dead, with hot water, or singeing them with lighted straw. Consequently the hogs' skins which we use are chiefly imported from abroad. The *bristles* of swine are made into brushes of various kinds, and are also employed by shoe-makers in the place of needles.

Among the other uses of swine, it may not generally be known that, in the island of Minorca, they are employed as beasts of draught. They are frequently yoked to the plough with asses; and one writer speaks of having seen a cow, a sow, and two young horses, all yoked together, and of these the sow drew the best. In some parts of Italy swine are used in hunting for truffles, an eatable species of fungus which grow at the depth of some inches in the ground. A cord being tied to the hind leg of one of these animals, the beast is driven into certain pastures; and we are told that truffles are always to be found wherever he stops and begins to turn up the earth with his nose.

Most writers have asserted that swine are long-lived, but few instances are allowed to occur of their at-

taining a great age; as it is neither profitable nor convenient to keep them to the full extent of their time. A gentleman in Hampshire kept a sow till she was nearly seventeen years old; and, at this period, she began to exhibit some signs of old age by the decay of her teeth, and ceasing to be so fertile as she had previously been. This animal afforded an instance of the extremely prolific nature of swine. She is calculated to have been the parent of no fewer than 300 young ones. The great weight to which swine are sometimes fed would appear altogether incredible had it not been well attested. In one instance a pig was known to weigh 1410 pounds when alive; and 1215 pounds when killed and dressed.

ORDER VII.—CETE, or CETACEOUS ANIMALS.

117. *The NARWAL, or SEA-UNICORN (Monodon monoceros) is a marine animal from twenty to thirty feet in length, with a long, tapering, twisted, and pointed weapon of ivory in front of the head.*

It has a small fin on each side of the breast, in place of fore feet, an horizontally flattened tail, and a spiracle or breathing hole on the highest part of the head. The skin is white, variegated with numerous black spots on the upper parts of the body; and the weapon is generally from five to eight feet in length.

These animals are found in the Greenland seas, and they occasionally migrate southward off the British coasts. Their name of narh-wal signifies a whale that subsists on dead bodies.

The Greenlanders pursue the narwals as they do other whales, chiefly on account of the oil which they obtain from them. This is considered superior, in many respects, to the oil of the great whale (118), and is used by them both with food and to burn in their lamps. These people also eat the *flesh* of the narwal prepared by fire, dried in a half putrid state, and sometimes even raw; and they are also partial to the *intestines* as food. The *tendons* serve them as a strong kind of

thread. The projecting *weapon*, which is not a horn but a species of tusk, in its substance not much unlike the tusk of an elephant, is sometimes cut into the heads of arrows; and, in some parts of Greenland where wood is scarce, these weapons are occasionally used in the structure of tents and sledges. As ivory, they are not of much use, since, from their twisted form, they cut to great disadvantage. The kings of Denmark have, in the castle of Rosenberg, a throne formed of the tusks of the narwal.

It has of late years been ascertained that the Japanese have a very extraordinary opinion of the medical virtues of these tusks. A Dutch merchant, on his return to Europe, happened, among other curiosities, to transmit one of them to a friend in Japan, who by the sale of it became extremely rich. From that time the Dutch wrote, to their correspondents in Europe, for as many as could be sent, and great profit was made of them; and, although by the continued importation, the price has since been considerably diminished, it still continues very high.

Narwals are quick, active, and inoffensive animals. They swim with considerable velocity. When harpooned they dive in the same manner as the whale, but not so deep. They generally descend about two hundred fathoms, after which they return to the surface, where they are dispatched, in a few minutes, with a lance.

118. The *GREAT* or *GREENLAND WHALE* (*Balaena mysticetus*, Pl. 1, Fig. 17) is a marine animal of immense magnitude, measuring from fifty to eighty feet in length, of which the head is nearly one third, and having several horny blades in the upper jaw, and a spiracle or breathing hole on the upper part of the head.

The bulk of these animals is such that their greatest circumference is nearly equal to their length; and their weight has been known to exceed 400,000 pounds. The mouth is of enormous size, extending as far back as to the eyes; and the tongue is sometimes eighteen or twenty feet in length, and nine or ten in width. Notwithstanding this, the gullet, or passage of

the throat, is seldom more than four or five inches across. The eyes are situated a little above the corners of the mouth, and are scarcely larger than those of an ox; and the external opening of the ears, which are merely auditory holes, is likewise very small. There is a large fin on each side of the breast, and the horizontally flattened tail-fin is equal to about one sixth part of the length of the animal. On the back there is neither fin nor protuberance. The skin is very thick and strong, entirely destitute of hair, and always covered with an oily substance which issues through the pores, and which, when exposed to the rays of the sun, makes the surface appear as resplendent as that of polished metal. Whales vary much in colour; some being entirely black, others reddish, or black above and white beneath, and others variously mottled with black or brown and white.

The great whales are inhabitants of the ocean, and found chiefly in the Greenland and other seas, near the Arctic Pole; they, however, sometimes migrate so far south as to be seen in the neighbourhood of the British shores.

The animals of the whale tribe are of great use to mankind in a commercial view. They are pursued by the inhabitants of nearly all the maritime countries of Europe, and to us are not merely a source of profit, but, from the whale fishery requiring many ships, are the means of training a great number of seamen. To this fishery it is that we are indebted for those two valuable articles—*whale or train oil*, and *whalebone*.

The fat of all the whales has the name of *blubber*, and is principally found beneath the skin, to the depth of ten or twelve inches. Its use, to the animals, appears to be for the double purpose of poisoning their bodies, and keeping off the immediate contact of the water from the flesh, the continued cold of which, in the frozen climates of the North, would tend to chill the blood. The *whalebone* supplies, in these animals, the place of teeth, for catching and securing their food. It is attached to the upper jaw, and is arranged in thin plates or blades, sometimes near seven hundred in number, and parallel to each other on both sides of the mouth. The largest blades measure from ten to

fifteen feet in length, and twelve or fifteen inches in width; and they all terminate in a kind of fringe of considerable length, which has the appearance of the blades split into innumerable small fibres. A large whale sometimes yields a ton and half of whalebone.

The number of ships employed in the whale fishery is very great; but, in consequence of the incessant pursuit of these animals for the last two centuries, their numbers have been greatly diminished. One of the most fortunate years that ever was known was 1697, when the following ships entered the bay of Greenland:

15 from Bremen, which had taken	- - -	190
50 from Hamburgh	- - - - -	515
121 from Holland	- - - - -	1252

Total number of whales taken	- -	1957
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The year 1814 was a singularly prosperous one to the British whale fishery: 76 ships, fitted out from different ports of this country, obtained 1437 whales, besides seals, &c. The British ships, during four years, ending with 1817, returned with 5030 whales, which produced 54,508 tons of oil, and 2697 tons of whalebone.

The season for the whale-fishery commences in May, and continues through the months of June and July; but the ships must come away before the end of August, otherwise they might be blocked up and destroyed by the ice.

Every ship sent out from this country carries along with it six or seven boats, each of which has one harpooner, one man at the rudder, one man to manage the line, and four men as rowers. In each boat there are also two or three harpoons, several spears, and about six lines, each 120 fathoms in length, fastened together. As soon as the men in the boats discover a whale, swimming near the surface of the water, they approach to the spot, and strike a harpoon deeply into his body. To this instrument the line is attached; and on the whale

plunging into the water, this line is allowed to run out, great care being taken not only to prevent it from catching, lest the animal should overset the boat, but also (by continually wetting the place against which it runs) to prevent its rapid motion from setting fire to the wood. After a while the wounded animal is obliged to return to the surface to breathe. His direction is followed, and his re-appearance carefully marked. With great dexterity fresh wounds are inflicted, till, at length, he appears exhausted, when a long spear is thrust into his intestines, which soon destroys him. The whale is then dragged to the ship, and securely fastened to the side by ropes attached to the fins and tail. The blubber is cut out, in large square pieces, by men who get upon the animal, having their shoes armed with a kind of iron spurs to prevent their slipping. As soon as the blubber is taken on board the vessel, it is divided into smaller pieces, and thrown into the hold to drain.

The next operation is to extract the whalebone. This is done entire, along with the guns, which are hoisted on the deck, where the blades are cut and separated, and left until the men have leisure to scrape and clear them. The *tongue* consists of a soft and spongy fat substance, which, when boiled down, yields five or six barrels of oil; the oil that is drained from the two upper jaw-bones is the peculiar perquisite of the captain. As an encouragement to the whale fishery, a bounty of twenty shillings is allowed by Government for every ton of blubber which is imported into this country.

From Milford, in Pembrokehire, and some other British sea-ports, vessels are also fitted out for the South Seas, in pursuit of whales which frequent the ocean in those torrid climates, particularly near the coast of South America.

The inhabitants of Greenland, and of other northern countries of the world, eat almost every part of the whale. The *skin*, the *tail*, and the *fins*, are sometimes eaten even raw. The *flesh* is eaten both fresh and

dried. That of the young animals is of red colour; and, when cleared of fat, broiled and seasoned with pepper and salt, is said to eat not unlike coarse beef. That of an old whale appears black, and is exceedingly coarse and unpalatable. The Esquimaux, however, eat both the flesh and fat of the whale, and drink the oil with greediness. Indeed some of the tribes carry, in their canoes, bladders filled with whale oil, which they use in the same way, and with a similar relish, that a British sailor does a dram. They also eat the *skin* of the whale raw. It is not unusual for female Esquimaux, when they visit whale ships, to select for eating, pieces of skin to which a portion of blubber is attached. They also give it for food to the infants suspended at their backs, who suck it with great apparent delight. The *heart* of a young whale which was caught in the year 1793, and measured fifteen feet in length, is said by Captain Colnett to have afforded a delicious repast to his ship's crew. Of the *intestines* of the whale the Greenlanders prepare a substance which serves instead of glass for their windows. They make fishing-lines of the *filaments* which terminate the blades of whalebone; and in many countries, the ribs and other large *bones* supply the place of timber, in the construction of houses, and as fences to surround gardens and fields. The smaller bones are converted into harpoons and spears. The *tendons* are split into filaments, and used as cordage, and for nets of various kinds. With the Esquimaux some of the membranes of the abdomen are used for an upper article of clothing; and the thinnest and most transparent of them are adopted, instead of glass, in the windows of their huts. The *blubber* of the whale, when pickled and boiled, is said to be very palatable; and the *tail*, when parboiled and fried, is often adopted in the Greenland ships as food. The blubber, when in a fresh state, is destitute of any unpleasant smell: indeed it is not until the termination of the voyage, when the cargo is unstowed, that a Greenland ship becomes disagreeable. The use of the

whalebone in our own country is well known; but, since ladies have left off wearing stays, it is at present comparatively in little demand. By a late invention it is manufactured into hats, bonnets, and brushes.

Whales are sometimes seen in troops sporting about near the surface of the ocean. They spout water through the spiracles on the top of their heads, with the rushing noise of a cataract, and to the height even of thirty or forty feet. Such are their powers in the water that, in some instances, their motion through that element has been calculated at thirty feet in a second, or upwards of twenty miles in an hour. Great caution is required in attacking them, as, with a single blow of their tail, they are able to upset a tolerably large boat. They feed only on the smaller kinds of fish and other marine animals, as their throat is not sufficiently wide to admit of their swallowing any substance of large size, and they are not furnished with teeth to cut or grind their food into small pieces. The females produce only one young one each: this they suckle for many months, and are peculiarly affectionate and attentive towards it.

These animals are occasionally stranded on the British shores, in which case, by the ancient laws of the land, they are deemed royal fish; the king being entitled to the anterior, and the queen to the posterior half.

119. *The FIN-BACKED WHALE, or FIN-FISH* (*balæna physalus*), is a marine animal from sixty to ninety feet in length, with a thick fin on the hinder part of the back, the muzzle tapering, and the jaws somewhat pointed.

This species is of more slender form than the last, its greatest circumference not in general exceeding fifteen or twenty feet. The spiracle or breathing hole is double, and situated on the middle of the fore part of the head; and the colour of the body is generally dark or blackish olive above, and white below. The whole surface appears polished and shining.

These whales are chiefly found in the northern frozen ocean, and particularly about the coast of Greenland and Spitzbergen. But they sometimes enter the Mediterranean, and are not uncommon in the South American and Indian seas.

Although a smaller proportion of *oil* is obtained from these than from the great whales, it is of much better quality than that. The inhabitants of Greenland consume it with their food, preferably to burning it in lamps, if oil of less value can be obtained for that purpose. The *whalebone* is too short and narrow to be of much value. From the small quantity of oil, and little value of the whalebone, added to the difficulty and danger which are attendant on the pursuit of these active and powerful animals, they are not very eagerly sought after by the whale-fishers.

We are assured that the *flesh* of the fin-backed whale is as well tasted, and, in every respect, as excellent, as that of the sturgeon. In most of the northern countries, both of Europe and America, the *fins*, the *skin*, and the *tendons*, all serve for many useful purposes.

There are other species of whales which are useful, in a certain degree, to mankind, for the oil that is yielded by their bodies; but few of them are objects of pursuit, on account of the difficulty there is in killing them, or of the very inferior quantity of oil which they afford. The blades of their whalebone are also too small to be of any use as an object of commerce.

120. *The BLUNT-HEADED CACHALOT, or SPERMACETI WHALE* (*Physeter macrocephalus*) is a marine animal from sixty to seventy feet in length, with large teeth in the under jaw, which fit into corresponding sockets of the upper jaw; the orifice of the spiracle single, and at the upper part of the extremity of the muzzle; and without any fin upon the back.

The head occupies about one-third of the length of the whole body. The colour of this whale is generally black, but, in the old animals, the under parts become whitish. The skin is smooth, oily, and almost as soft to the touch as silk.

It is most frequently seen in the northern ocean, in the latitudes of Greenland, Spitzbergen, and Iceland; yet it is occasionally observed off the British coasts, and sometimes even in the Mediterranean.

Lucrative as the several parts of these animals are,

the whale-fishers have a great dread of them, in consequence of their astonishing activity in the water. Much care is requisite, in striking the harpoon, to keep the boats out of danger of being overturned, and great dexterity in following their track. From the relation given by the Danish voyagers Olafsen and Povelsen, it would appear that the spermaceti whales become occasionally so ferocious as even to seize the fishing boats with their teeth, and, in an instant, to destroy the whole crew. Notwithstanding all these dangers, so highly valued are they that they are searched for with much assiduity: and happy are the owners of those vessels which can obtain the greatest number of them.

The *oil* that is obtained from them is not in great quantity, but is of excellent quality. In burning it yields a bright flame, without exhaling any noxious smell.

The white and fatty substance known in our shops by the name of *spermaceti* is found in an immense cavity of the skull, distinct from that which contains the brain. This sometimes occupies nearly the whole front and upper part of the head, and, in some instances, is known to measure sixteen or eighteen feet in length. It is divided horizontally into two parts by a strong membrane, and each of these parts is again subdivided, by vertical membranes, into numerous cells, which communicate with each other, and contain the spermaceti. This, which is frequently mistaken for the brain, is sometimes found in such quantity as to fill eighteen or twenty butts. Whilst the animals are alive, the spermaceti is in a fluid state; but, when dead, it is found in somewhat solid lumps, and is of whitish colour. Spermaceti is of considerable use, medicinally, in pains and erosions of the intestines, in coughs, and other complaints. It is also applied externally in ointments, and for other purposes. It is converted into a very beautiful kind of candles, which appear to be a medium between those made of wax and tallow. Good spermaceti is in fine white flakes, glossy, and semi-trans-

parent, soft, and unctuous to the touch, yet dry and easily friable, in taste somewhat like butter, and of faint smell, not much unlike that of tallow. If exposed to the air, it soon becomes rancid and yellow. Its quality and colour may however be recovered by steeping it in alkaline liquors, or in a sufficient quantity of spirit of wine.

The *flesh* of this kind of whale is of pale red colour, appears not much unlike coarse pork, and is not unpalatable as food. The *skin*, *intestines*, and *tendons*, are all useful to the inhabitants of the northern countries of Europe. The *tongue* is considered excellent eating. The *teeth* are formed into the heads of spears and arrows, and may even be used as ivory; the *bones* are sometimes applied as timber for tents and cottages; and a very tenacious glue or size is manufactured from the *fibres of the flesh*.

It is to these, and some other animals nearly allied to them, that we are indebted for the drug or perfume called *ambergris*. This is generally found in the stomach, but sometimes in the intestines, and in lumps from three to twelve inches in thickness, mixed with many substances very different from itself, such as macerated vegetables, the remains of marine shell-animals, the bones and other hard parts of fish; and the ambergris itself frequently contains the beaks or jaws of different species of *sepia*, or cuttle-fish. The latter are the cause of those yellowish, whitish, or dusky spots that are often observable in this drug. As we see it in the shops, ambergris is an opaque substance, which varies in solidity, according to its exposure to a warm or cold atmosphere. It is however, in general, sufficiently hard to be broken. Its smell is extremely powerful and agreeable to some persons, but unpleasant and even nauseous to others. When first taken from the stomach or intestines of the animals which produce it, ambergris is quite soft to the touch; and, as may well be conjectured from the situation in which it is found,

has a fetid and most disgusting smell ; but after it has, for some time, been exposed to the influence of the atmosphere, it becomes harder, and yields the powerful and peculiar odour by which it is characterized.

Oil, spermaceti, and ambergris, are supposed to be yielded in greater or less quantity from every species of cachalot.

121. *The COMMON or TRUE DOLPHIN* (*Delphinus delphis*) is a cetaceous animal nine or ten feet in length, with a row of large teeth in each jaw, and a single orifice near the top of the head; an oblong and roundish body, a fin on the back, and the snout narrow and pointed, having a broad transverse band or projection of the skin on its upper part. The body is black, with a bluish tinge above, and white below.

Dolphins are found in nearly every part of the ocean.

Few animals have had greater celebrity than these. Their activity in playing about near the surface of the ocean, their undulating motion, and the evolutions and gambols of whole shoals of them together, occasionally afford to mariners and others a very entertaining spectacle. By the ancient Greeks and Romans dolphins were supposed to entertain a kind of friendship towards mankind, and were consecrated to the gods. In cases of shipwreck they were believed to be in waiting to rescue and carry on shore the unfortunate mariners. Pliny, the Roman naturalist, was credulous enough to believe that dolphins had been rendered so tame as to allow of persons mounting on their backs, and being carried in safety over a considerable space of sea. As these animals, in their progress through the water, often assume a crooked form, in order to spring forward with the greater force, both ancient and modern artists have depicted the dolphin with its back curved.

The *flesh* of the dolphin is hard and insipid, yet it was formerly in repute as food even in this country. We are informed by Dr. Caius, that a dolphin which was caught, in his time, at Shoreham, in Sussex, was sent to the Duke of Norfolk, who had part of it roasted

and served up at table with a sauce made of the crumbs of white bread mixed with vinegar and sugar. The *tongue* of the dolphin is said to be very agreeable to the taste, and to be in every respect delicate eating. The *fat*, which, as in other cetaceous animals, lies, for the most part, immediately beneath the skin, is not in great abundance.

It is to be remarked that seamen give the name of dolphin to another kind of animal, the *DORADO* (*Coryphæna hippuris*). The latter, however, is a genuine species of fish, and not, like the present, a warm-blooded and mammiferous animal.

122. The *PORPESSE* (*Delphinus phocæna*) is a cetaceous animal, six or seven feet in length, with a somewhat conical body, a row of pointed teeth in each jaw, a single spiracle near the top of the head, a broad fin about the middle of the back, and a short and bluntish muzzle.

Its colour is bluish black above, and white beneath, and the skin is bright, smooth, and soft to the touch.

These animals are found in the Baltic sea, near the coasts of Greenland and Labrador, in all parts of the Atlantic, and even in the Pacific Ocean.

In most of their habits the porpesses have a near resemblance to the dolphin, but they are not so active. They generally associate in troops of from six or seven to thirty and upwards in number, and feed on fish of all kinds, but particularly on such as swim in large shoals, as mackerel, herrings, and the different species of the cod.

In proportion to the size of their body, porpesses yield a great quantity of excellent *oil*; but from the difficulty there is in catching them, in sufficient number to repay the labour, they are seldom thought worth pursuing. The *flesh*, as well as that of the dolphin, was formerly in great estimation in England. Among the provisions for the celebrated inthronization feast of George Neville, Archbishop of York, in the reign of Edward the Fourth, are enumerated no fewer than twelve porpesses and seals. These animals, however,

are now entirely neglected with us as food ; yet the inhabitants of Greenland and Lapland consider the flesh of the porpesse as highly excellent. The former even eat the *fat*, the *entrails*, and the *skin* ; but they seldom cook the flesh till its hardness is destroyed by long keeping. The Americans use the *skins* (dressed in a peculiar manner) for making waistcoats and breeches ; they also form them into an excellent covering for carriages.

CLASS II.—BIRDS.

ORDER I.—ACCIPITRES, OR RAPACIOUS BIRDS.

123. *The AQUILINE or EGYPTIAN VULTURE* (*Vultur percnopterus*) is a large bird of prey, which has a naked head and neck ; a black and hooked beak, yellow at the base ; and the quill feathers of the wings, except the first two, black, edged with hoary.

The male is of a dirty white colour, and the female brown, with the above exception of the quill feathers.

Immense flocks of aquiline vultures are observable near all the principal towns of Egypt, Syria and Persia.

Filthy and disgusting as these birds are, not only in their appearance but in all their habits, they are of almost indispensable utility to mankind in those countries where they are found. They may be considered the scavengers of hot climates. In conjunction with other animals of similar appetites and propensities, they clear away, by devouring them, all the remains of animal substances which otherwise would be left to putrefy, and would infect the air with the most noxious effluvia. They are consequently protected and encouraged by mankind. The ancient Egyptians held them in such veneration as to punish with death any

person who destroyed them. In consequence of this protection, they have become fearless of mankind, and, even in the streets of the most populous towns of Egypt, may be seen to feed with the greatest familiarity.

These vultures devour also the eggs and young ones of the crocodiles, and destroy myriads of rats and mice, as well as reptiles of every description, which abound among the mud, and in all the grounds that are fertilized by the overflowing of the Nile.

124. *The CARRION VULTURE* (*Vultur aura*) is an American bird of prey, about four feet and a half high, with a small head covered with red skin, the bill hooked and white; and the plumage dusky, except the quill feathers, which are black.

In America these birds are protected for the same services as are performed by the aquiline vulture (123) in Africa and Asia. They not only devour the filth of the towns and villages, but also destroy, in great numbers, the eggs of alligators; which animals otherwise would become intolerable by their prodigious increase. The vultures watch the females in the act of depositing their eggs in the sand; and, as soon as they retire into the water, dart to the spot and feed upon their contents.

125. *The CINEREOUS EAGLE* (*Aquila albicilla*) is a species of eagle about the size of a turkey, of cinereous brown colour, with white tail, the quill feathers white, the middle ones tipped with black; and the base of the bill, and the feet, yellow.

This bird is found in England, and in nearly every other country of Europe.

The *flesh* of the cinereous eagles is eaten in Greenland, and is said not to be of bad flavour. Their *skins*, sewed together, are used as under garments; and are also frequently employed as beds. The *beak* and *claws* are employed as amulets or charms; and are considered efficacious for the cure of various complaints. The Greenlanders either kill these birds with arrows, or

catch them in snares laid in the snow, and baited with flesh.

The cinereous eagles feed on dead animals of every description, as well as on fish, young seals, and several kinds of birds.

126. *The SECRETARY FALCON* (*Falco serpentarius*) is a bird of prey of large size, with a bill hooked at the point and bearded at the base, black plumage, a crest on the hind part of the head, the tail feathers white at the tip, the two middle ones the longest, and the legs of great length.

This bird is about three feet in height, and, in its general appearance, has some resemblance both to the eagle and the crane.

It is an inhabitant of the interior of Africa, of some parts of Asia, and several of the Asiatic islands.

As a destroyer of noxious reptiles and other injurious animals, the secretary falcon is of great service to mankind. He attacks without fear even the most poisonous serpents, approaching them with the point of one of his wings, and either trampling them to death with his feet, or catching them on the pinion of the other wing, and throwing them into the air several times successively until they are dead.

This bird is easily domesticated, in which state he is not only serviceable in destroying reptiles and serpents, but he might probably also be useful in devouring rats and mice. Poultry of all kinds ought, however, to be kept out of his way, or he would devour them also.

127. *The GENTIL FALCON* (*Falco gentilis*, Fig. 31) is a British bird of prey about two feet in length, distinguished by its ash-coloured plumage, with brown spots; the tail having four blackish bands, and the base of the bill and the legs being of yellow colour.

It inhabits several of the mountainous parts of Europe and North America.

This was one of the several kinds of birds that were in great repute in *falconry*; a sport which, some cen-

turies ago, was pursued in all the principal courts of Europe, and anterior to that by the ancient Greeks and Romans. The estimation in which this sport was held may well be supposed when it is stated that, at one period, scarcely any person of rank appeared abroad without a hawk on his hand; and that, in old paintings, this representation is considered even a criterion of nobility. The English laws enacted for the preservation of falcons were so rigorous, that in the reign of Edward the Third it was rendered felony to steal one of these birds; and for a person to take the eggs, even in his own grounds, he was liable to be imprisoned for a year and a day, besides a fine at the king's pleasure. The falcons or hawks chiefly used in the British dominions, were the present species, the *Peregrine falcon* (*Falco peregrinus*), *Iceland falcon* (*Falco islandus*), *Goshawk* (*Falco palumbarius*), and *Gyr-falcon* (*Falco candicans*). After the invention of gunpowder this sport fell gradually into disuse; until, at length, hawks were discarded, and the whole pleasure of killing feathered game was confined to shooting.

128. OWLS are birds of prey, distinguishable by their round head, a circular arrangement of feathers round each eye, the bill being hooked, and the nostrils being covered with bristly feathers.

These birds are of great service to farmers by devouring mice and other small animals, the uninterrupted increase of which would be extremely injurious to the fruits of the harvest. The late Rev. Gilbert White, in his *Natural History of Selborne*, states that he had paid considerable attention to the manner of life of a pair of white owls, which constantly bred under the eaves of the church. He says that, generally, about an hour before sunset they sallied forth in quest of mice; that he has often minuted the birds with his watch for an hour together, and found that the one or the other of them returned to the nest about once in five minutes, with a mouse in its claws.

Though serviceable in thus destroying mice, these birds also destroy young rabbits, hares, and partridges, for which they are execrated by sportsmen; and they sometimes enter pigeon-houses, where their ravenous propensities cause them to commit great devastations.

129. *The GREAT or CINEREOUS SHRIKE* (*Lanius excubitor*) is a small bird of prey, distinguished by having a straightish black bill with a notch in each mandible near the end: the back hoary, the wings black, with a white spot, and the tail white at the sides.

There is likewise a black stripe on each side of the head, extending backward from the base of the bill. The length of this bird is about eight inches.

It inhabits the woods of Europe and America.

Such are the courage and address of the cinereous shrike, that it is capable of being trained to hawk for and catch small birds. We are informed that Francis the First, king of France, was frequently in the habit of chasing the smaller kinds of game with shrikes.

In some parts of the Continent where these birds are very numerous, they are considered so useful, by waging continual war against rats and mice, and destroying great numbers of noxious insects, that the farmers will not allow them to be destroyed.

It is the singular propensity of the cinereous shrike to stick the insects on which it feeds upon the thorny branches of trees, previously to eating them. Even when confined in a cage, it often adopts a similar mode with respect to its food, by sticking it against the wires.

ORDER II.—PICÆ, OR PIES.

130. *The RAVEN* (*Corvus corax*) is a bird of the crow tribe, known by its large size, its plumage being of bluish black colour, and its tail being roundish at the end.

It is found in almost every country of Europe, Siberia, and North America.

In Egypt these birds are held nearly in equal veneration with the vultures (123), on account of their pro-

pensity to devour dead animals, and putrid substances of almost every description. They also destroy rats, mice, and small reptiles. It is said that in the Bermudas the inhabitants were, for several years, annoyed by a prodigious increase of rats, which devoured the corn and plants, and swam from island to island, committing great depredations in every place; and that, at length, they suddenly disappeared, without any other assignable cause than the unexpected presence of several flocks of ravens. By the ancients these birds were esteemed of much importance, from a notion that, by the various modulations or tones of their voice, certain future events might be predicted.

Ravens are easily domesticated, and in this state may be trained to fowling, somewhat in the same manner as falcons (127). They may also be taught to fetch and carry small objects, like spaniels; but they are so mischievous that they ought not to be trusted in any place where spoons or other valuable articles are deposited, lest they also carry them away and hide them.

The *flesh* of the raven is eaten by the inhabitants of Greenland; and the *skin*, with the feathers on, is preferred to most other substances as a warm under garment. The *beak* and *claws* are used, in that country, as amulets. With us the *quills*, cut to a point, were formerly much in request for what are called the jacks of harpsichords, to strike the wires in playing. They are now chiefly employed for drawing and writing with.

131. *The ROOK* (*Corvus frugilegus*) is a bird of the crow tribe, distinguished by its black and glossy colour, the base of the bill being naked and dusky, and the tail being roundish.

These birds are found in Europe and Siberia.

Notwithstanding the prejudices which are entertained, by many farmers, against these birds, arising from a supposition that they feed upon grain, and consequently are destructive to the crops, there can be little doubt that the services they perform are infinitely greater than any injury they commit. Often may

flocks of them be seen following at a little distance the ploughs, to devour the grubs or caterpillars of such insects as may be thereby exposed to their attacks. These of the cockchafer are destroyed by them in thousands; and it is remarkable that the nostrils, chin, and sides of the mouth, in old rooks, are white, and bared of feathers, in consequence, as it is supposed, of their frequent habit of thrusting their bill into the ground in search of these insects. The late Mr. Stillingfleet was informed, by an intelligent farmer in Berkshire, that, one year, while his men were hoeing a field of turnips, a great number of rooks alighted in a part of it where they were not at work; and that the consequence was a remarkably fine crop in that part, while in the remainder of the field there were scarcely any turnips.

Young rooks are sometimes used as food; but it is requisite to skin them, previously to their being cooked, as otherwise they would be too strong-tasted to be eaten.

132. *The RED-BELLIED TOUCAN* (*Ramphastos picatus*) is a bird about twenty inches in length, with an enormously large bill of yellowish green colour, and serrated at the edges; the upper part of the body blackish, the breast yellow, and the belly and the tip of the tail red.

This bird is found in Africa, and in several of the eastern parts of South America.

We are assured, by travellers in South America, that the red-bellied toucans are held in great esteem by the Indians, not only on account of their *flesh* as food, but also for their *plumage*; particularly the feathers of the breast, which are used to ornament their dresses. The Indians even cut out the skin of this part, with the feathers on, and, after it has been dried, glue it to their checks, considering it a great addition to their beauty. We are informed by one of the French voyagers that, whilst he was off the island of St. Catherine, near the coast of Brazil, the governor, among

other presents, sent on board the ship fifty skins of toucans which had been dried with the feathers on.

133. *The BIRD of PARADISE* (*Paradisea apoda*, Fig. 32) is characterized by its having a chesnut-coloured body, the neck being of a gold green colour beneath, the feathers of the sides being longer than the body, and the two middle tail feathers very long and bristly.

These birds inhabit New Guinea and the adjacent islands of Aroo; being found on the former in the fine, and the latter in the rainy seasons.

To the inhabitants of the islands of Aroo the birds of paradise have, for many centuries, been an important article of commerce. They are shot with blunt-headed arrows; or caught by birdlime or in snares. As soon as they are killed their legs are cut off, as, by that means, the skins are more easily preserved, and also because the persons who purchase them prefer them thus. The entrails and breast-bone are taken out, and they are dried with smoke and sulphur, for exportation to Banda and other commercial settlements.

They are in great demand both in Persia and India to adorn the turbans of persons of rank, and even the handles of sabres and the trappings of horses. Many of them are also sold to the Chinese; and, a few years ago, they were a very fashionable ornament for female head-dress in England.

The appellation of birds of paradise has been given to these birds from a notion, formerly prevalent, that, destitute of feet, they were constantly in flight, even during their sleep; or that, if they did rest, it was only for a few moments together, and then suspended the branches of trees by the long feathers of their tail: that the female deposited her eggs in a hollow place on the back of the male, and there sat upon and hatched them, that they fed only on dew: that, destitute of stomach and intestines, the whole abdominal cavity was filled with fat; and, lastly, that they never touched the earth until their death. It is somewhat difficult to account for the origin of notions

so absurd, unless we are to suppose them the inventions of persons who traded in the skins of these birds, and founded merely in the very extraordinary nature of their plumage, and the circumstance of such skins being always sold without the legs.

Birds of paradise generally associate in flocks of forty or fifty together. They form their nests in trees, and feed on fruit and insects. Their legs are so short that, when they alight upon the ground, they cannot, without difficulty, rise again into the air.

134. *The BEE CUCKOO, or MOROC (Cuculus indicator), is an African bird somewhat larger than a sparrow, of rusty grey colour above, and whitish beneath; it has naked and black eyelids, a yellow spot on the shoulders, and the feathers of the tail somewhat rust-coloured, marked with white.*

The great partiality which these birds have to honey and the maggots of bees, as food, is the cause of their pointing out the hives of wild bees to the inhabitants of those countries in which they are found. As soon as the moroc has itself discovered a nest of bees, it utters a loud and continued cry, as if for the purpose of exciting attention to its wants. If followed by any person, it flies slowly towards the place, alighting from time to time, to give opportunity for its attendant to come up. If the hive be in the cleft of a rock, a hollow tree, or in some cavity of the earth, the moroc will hover over the spot for a short time, and then sit, at a little distance, in expectation of the result, and apparently with a view of sharing in the plunder. When the bee-hunter has taken the nest, he generally leaves a share of the comb to supply the wants and repay the services of the bird. We are informed by M. Le Vaillant that the Hottentots have so great a regard for these birds that they consider it criminal to kill them.

135. *WOODPECKERS are a numerous race of birds, distinguished by having a straight, strong, and angular bill, and their tongue very long, slender, bony, hard, and jagged*

at the end. Their toes are formed two forward and two backward.

The English species of woodpeckers are somewhat injurious in woods and plantations, from their propensity to pick holes in trees as places for their nests. By this means the rain has admission to the wood, and often causes its speedy decay. In forming these holes the birds fix themselves firmly against the trees by their claws and tail, the feathers of which are remarkably stiff: and they are able to pierce even the soundest and hardest timber.

It does not appear that any of the English species of woodpecker are of further use than by their subsisting on such insects as are found upon the bark, or in crevices or holes of trees; but there can be no doubt that they are very serviceable, by destroying great numbers of the grubs of these timber-eating beetles, some of which bore to great depths, and have holes of considerable size.

Some of the tribes of Tunguses roast these birds; then bruise their bodies, and mixing the substance thus formed with fat, cover with it the points of arrows which they use in the chase, under a notion that such animals as are struck with these arrows immediately fall dead.

Of the bills of the *WHITE-BILLED WOODPECKER* (*Picus principalis*) some of the American Indians make a kind of coronets, by setting them in a wreath with the points outward. And such is the value at which they estimate these coronets, that they frequently purchase the bills at the rate of two and even three deer's skins each.—The flesh of some of the species is accounted good eating.

ORDER III.—PASSERES, OR PASSERINE BIRDS.

136. *The SONG THRUSH, or THROSTLE* (*Turdus musicus*), is a bird known by its almost straight bill, notched near the end of the upper mandible; and its quill feathers being rust-coloured at their inner base.

This bird inhabits woods of all the temperate parts of Europe.*

Although the singing birds may not, on account of their melodious notes alone, be considered of any absolute use to mankind, yet these afford us so much delight, and convey to our minds so many pleasing and cheerful emotions, that they must not be overlooked even by such persons as are in search of the useful productions of nature.

For fulness and clearness of tone, the throstle is excelled by none of the British song-birds; and in plaintiveness, compass, and execution, it is much superior to the blackbird. Its notes are heard in woods and thickets during nearly nine months of the year, but are much too powerful to be pleasant when kept in a room. Some of the inhabitants of Poland catch thrushes in such numbers as even to load small vessels with them for exportation to other countries.

During long droughts in the summer-time these birds are of great service by hunting out shell-snails, which they eagerly pull in pieces as food for their offspring.

They build their nests in thickets or orchards, and sometimes in thick hedges near the ground. The outside consists of moss interwoven with dried grass or hay, and the inside is curiously and smoothly plastered. The female generally lays five or six eggs of deep blue colour, marked with black spots.

137. *The FIELDFARE* (*Turdus pilaris*) is a bird of the thrush tribe, distinguished by the tail feathers being black, ex-

cept the outermost, which, at their inner edge, are tipped with white; and by the head and upper part of the body near the tail being of a hoary colour.

These birds annually visit England at the beginning of winter, arriving in large flocks from the northern parts of Europe. They are also found in Syria and Siberia.

By the ancients, fieldfares, with some other species of thrush, were in great esteem as food. The Roman epicures, as we are informed by Varro, had them fattened with crumbs of bread mixed with minced figs; and the people employed for this purpose kept thousands of them in successive states of preparation for the table. With us they are sometimes eaten, but they are by no means esteemed as a luxury.

Fieldfares do not breed in this country. They generally leave us about the end of February or the beginning of March, and do not return till the commencement of winter.

138. *The BLACKBIRD* (*Turdus merula*) is a species of thrush, of black colour, with the bill and eyelids yellow.

The plumage of the female is generally brownish on the under parts.

These birds are found in nearly all the countries of Europe, and in several parts of Asia.

The song of the male blackbird is much admired in woods and fields, but it is too loud for the house. In mellowness and sprightliness it is esteemed equal to that of the thrush (136), but in compass and execution it is considerably inferior. The blackbird begins its song in the first fine days of spring, and, except during the season of its moulting, or change of plumage, continues it until the commencement of winter.

Blackbirds devour vast numbers of worms and shelled snails. They form their nests in thick bushes externally of moss, roots, and other similar materials; plastering them internally with earth, and lining them with dry grass. The eggs are four or five in number, of light blue colour, with pale rust-coloured spots. Persons who rear these birds feed them as soon as they are taken from the nest

with a mixture of raw meat chopped small, bread, and bruised hempseed, somewhat moistened with water.

The song of the female is very different from that of the male.

139. The *BULFINCH* (*Loxia pyrrhula*) is a species of grosbeak, of cinereous colour, with the head, wings, and tail black, the breast and under parts red, the parts near the tail and the hindmost quill feathers white.

This bird is common in England and other parts of Europe.

Though in considerable esteem as a song bird, the bulfinch, in a state of nature, has but three cries, all of which are unpleasant. With attention, however, it may be taught to whistle almost any simple tune of moderate compass. It is even possible to instruct these birds to whistle in duet; but, in this case, the composition should be so arranged as to be in correct harmony, let the birds begin, stop, or go on in whatever parts they please. The Germans are noted for training these birds, and great numbers of them are annually imported into this country from Germany.

Bulfinches are very common in some parts of England, building their nests in bushes or low trees about the month of May. Their eggs are four or five in number, of bluish colour, with brown and faintly reddish spots towards the large end.

140. The *ORTOLAN* (*Emberiza hortulanā*) is a species of bunting, known by its quill feathers being brown, the first three whitish at the edges; and the tail feathers brown, the two lateral ones black on the outer side.

It is found in most countries of the Continent, but has never been caught in England.

During the months of July, August, and September, these birds become excessively fat; and, at that season, they are in great demand by epicures on the Continent. They are caught in vast numbers at a time, are kept in dark cages, and fattened for the table with oats and millet seed.

There is a great traffic in ortolans carried on by the

inhabitants of the island of Cyprus; where they are pickled in spice and vinegar, and packed in casks, each containing from 300 to 400 birds. In this state they are exported to France, Holland, and England, where they are sold at very high prices. We are informed that, in productive years, 400 such casks, or on an average 140,000 of these birds, are sacrificed, to the palate of man, in the island of Cyprus only.

By many persons ortolans are kept in cages as singing birds; and they are much esteemed on account of their song.

141. *The GOLDFINCH (Fringilla carduelis) is a small bird, distinguished by having all the quill feathers, except the two outermost, marked with yellow in the middle; the front of the head red; and the crown black.*

These birds are found in Europe, Asia, and Africa, and are very common in most parts of England.

As a songster this bird ranks high, but particularly on account of the vivacity and sprightliness of its tones; and, in addition to these, the beauty of its plumage, and the facility with which it may be instructed to perform many amusing tricks, have rendered it a great favourite. One of the commonest of these that they are taught is to draw up their own food and drink, in small cups formed for that purpose. If a young goldfinch be placed with any other singing bird it will readily learn its song.

Goldfinches, during the winter season, assemble in flocks; but they separate into pairs at the commencement of spring. They frequently construct their nests in orchards or large gardens; forming them externally of moss interwoven with other soft materials, in a most beautiful, compact, and artificial manner; and internally with grass, horse-hair, wool, and feathers. The eggs are five in number, and of white colour, speckled and marked with reddish brown.

142. *The CANARY-BIRD (Fringilla canaria) is a species of finch, the bill and body of which are generally of straw-colour, and the quill and tail feathers greenish.*

It is found wild in the Canary Islands, and also in several parts of the Continent, particularly the woods of Italy and Greece.

It was not until about the middle of the fifteenth century that these birds were first brought into notice. They were then called *sugar birds*, from an opinion that they were peculiarly partial to the sugar-cane as food. For some time afterwards they continued so dear that they could only be purchased by persons of fortune.

In Germany, and particularly in the Tyrol, great attention has, of late years, been paid to the breeding and rearing of canary-birds. At Ymst, in the Tyrol, there was formerly a company, who, after the breeding season was over, sent out persons to different parts of Germany and Switzerland, to purchase birds from those who bred them. Each person generally brought with him from three to four hundred birds. These were afterwards carried, for sale, through almost every country of Europe: and were usually conveyed on the backs of those who sold them.

We are informed that, in the Canary Islands, these birds have no song; and it is a well-established fact that nearly all the birds which are kept in cages are indebted for their song to parents, the progenitors of which have been bred with nightingales or tit-larks.

If canary-birds be treated with proper care they will breed three or four times in the year, and become as vigorous and healthy in this country as in their native islands. They are subject to many diseases, to prevent which the greatest care should be taken to provide them with pure water and simple food.

143. *The GREY LINNET (Fringilla linota) is a species of finch, of chesnut-brown colour, whitish beneath, the wings with a longitudinal white band, and the tail feathers edged on each side with white.*

It is a native of woods and thickets in most parts of Europe, and is sufficiently common in our own island.

The plumage of these birds is of obscure colour, but

their song is very sweet. In compass and execution it is inferior only to that of the nightingale. And so imitative are they that they will adopt the notes of almost any other bird with which they are brought up. The experiment was tried with three nestling linnets, one of which was reared under a sky-lark (145), another with a wood-lark (146), and the third under a tit-lark, and each adhered to the song of its instructor.

Linnets, when full grown, are caught, during the summer months, by twigs smeared with birdlime, or in nets; and, if properly attended to, they soon become tame. But if it be required that they should imitate the notes of other birds, they ought to be taken from the nest when only about ten days old.

These birds generally construct their nests in some thick bush or hedge, forming the outside with dried weeds and straw, and the inside of horse-hair and such soft materials as they can pick up. They lay four or five white eggs speckled with red.

144. The *COMMON SPARROW* (*Fringilla domestica*) is mentioned in this place only under a hope, in some measure, of rescuing its character from the extreme degree of odium with which it is loaded, in consequence of the supposed injury that it commits by feeding upon corn. This bird is by no means without its utility, even to the very persons who incessantly seek its destruction. On a calculation made by the late Professor Bradley, it was ascertained that a pair of sparrows, during the time they have young ones, destroy on an average 3360 caterpillars every week. He observed the two parents to bring to the nest at least forty caterpillars in an hour; and, on a supposition that they might have been thus occupied twelve hours every day, it will yield the above number per week. But their utility is not confined to the destruction of caterpillars. They likewise feed their young ones with butterflies and other winged insects, each of which, if

not thus destroyed, would be the parent of hundreds of caterpillars.

In many parts of the world sparrows are in considerable demand as articles of luxury for the table.

145. *The SKY-LARK (Alauda arvensis) is a small bird with slender bill, and the hind claw very long; the upper parts of its plumage are of a varied greenish brown colour, the external webs of the two outer tail feathers are white, and the two middle feathers are rust-coloured.*

These birds are found in every quarter of the world except America.

To all persons capable of experiencing pleasure from rural scenes, the notes of the lark are beyond description animating and delightful. During fine weather, from the earliest part of spring, for several succeeding months, they are every day heard. These birds sing whilst hovering in the air, and sometimes at so vast a height that they seem but a speck in the sky. In sprightliness their notes exceed those of any other bird except the goldfinch; and in compass and execution are inferior only to those of the nightingale.

Sky-larks, whilst in the nest, are fed on worms and insects; but when they are fledged they subsist chiefly on seeds, herbage, and other vegetable substances. It is remarkable, respecting them, that owing to the great length of their hinder claw they are not able to perch on trees, but always alight on the ground. Here they form their nest, generally in some hollow place, and lay four or five dusky eggs spotted with brown.

In the winter season sky-larks collect into large flocks, and are caught with different kinds of nets in vast numbers for the table. The neighbourhood of Dunstable is chiefly celebrated for them. The season commences about the 14th of September, and ends the 25th of February; and, during that time, as we are informed by Mr. Pennant, about 4000 dozen have been caught. In the country adjacent to the river Rhone, in France, as many larks have been caught by one person in a day as loaded two mules: and in

Saxony, where they are liable to a tax, an average sum equal to about 900*l.* sterling is annually paid to the city of Leipsic, on account of the larks that are caught in that neighbourhood.

146. The *WOOD-LARK* (*Alauda arborea*) is a bird smaller than the sky-lark, with slender bill, long hind claws, and a white streak over each eye, extending backward so as to form almost a ring round the head.

It is a very common bird in this country; and is found in other parts of Europe, and in Siberia.

There is, in the song of these birds, a plaintiveness and mellowness of tone which exceed those of any English songster except the nightingale; but their execution is much inferior to that of most others. They are not only heard in the day-time, but also during the night; and not only whilst in flight, but also when perched upon trees. Wood-larks are tender birds, and not easily to be reared in a cage.

Towards the beginning of winter they become fat, and are then considered excellent eating.

They generally form their nests in a bush near the ground, and have about four eggs of pale red colour, clouded, and mottled with red and yellow.

147. The *NIGHTINGALE* (*Motacilla lusciniæ*) is distinguished by the rusty brown colour, tinged with olive, of its upper parts, and by an ash-coloured ring on the naked part of the thigh above the knees.

It is a migratory bird, generally arriving in this country in the month of April, and leaving it in September, and then retires, as it is supposed, into some parts of Asia.

This bird delights in solitude, and is naturally of a wild and timid disposition. His usual resort is the side of some hill, especially if there be an echo. Here, perched upon the branch of a tree or shrub, he most delights to sing; and interrupts his warblings by short pauses, as if listening and making responses to the echo of his own voice.

The song of the nightingale is peculiarly mellow and

plaintive; and its compass, such as to reach through three octaves, and sometimes even more. In sprightliness it yields to the notes of the sky-lark, the linnet, goldfinch, and even the redbreast. A nightingale in singing its whole song was remarked to have sixteen different beginnings and closes; at the same time that the intermediate notes were generally varied in their succession with so much judgment, as to produce a most pleasing variety. It is to be remarked, that nightingales in general do not, in a wild state, sing more than ten weeks in the year; whilst those in cages continue their song for nine or ten months. Notwithstanding the naturally beautiful song of these birds, they readily adopt the notes of any other. They will even modulate their voice to a given key, and that so readily, that if any person whistle a note to it, the nightingale will immediately try in its strain an unison with that note.

Delightful as the song of the nightingale is, it is certain that some people have a dislike to it. We have even been told of a person who entertained so great an abhorrence for these birds as to have all the trees in his neighbourhood cut down, that, being thus without shelter, they might be driven away. It may perhaps be worth while to remark, in addition, that this person was delighted with the croaking of frogs.

The food of nightingales consists principally of insects, small worms, and the grubs of ants. They usually build their nests near the ground, among briars, in some low tree by a hedge or bush, and have four or five eggs.

148. *The WHEAT-EAR, or WHITE-RUMP* (*Motacilla cenanthe*), is a bird about the size of a sparrow, distinguished by its back being of a hoary colour; the forehead, a line above the eyes, and the rump being white, and by having a black band through each eye.

These birds are migratory, and found in the southern parts of England from about the beginning of May till the middle

or end of September. They are also found on the continent of Europe, in Asia, and Africa.

On the downs of Sussex the number of wheat-ears is sometimes so great that more than eighty dozen have been caught by one person in a day. They become fat in the autumn, and are then much esteemed for the table. During a rainy season they are fatter than in a dry one; this is accounted for by their feeding not only on insects, but on earth-worms, which come out of the ground in much greater numbers during wet than in dry weather. These birds are caught, by the shepherds, in snares made of horse-hair, and placed beneath a long turf. Part of them are eaten in the neighbourhood, part are pickled and sent to London for sale, and many are potted. When eaten fresh, they are generally roasted, wrapped up in vine leaves.

Wheat-ears breed in old rabbit-burrows, in holes of cliffs, under old timber, and in other situations on the ground. They form a large nest, and have from six to eight light blue eggs.

149. The REDBREAST (*Motacilla rubecola*) is distinguished by the dusky olive colour of its plumage and its red breast. It is found in nearly every country of Europe.

This interesting little bird is by no means despicable as a songster, being equal or superior to the goldfinch in every particular except the sprightliness of its notes; and its song is more valuable, as it is occasionally heard even in winter and the earliest part of spring. So quick are its powers of imitation, that a young red-breast, educated under a very fine nightingale, which began already to be out of song, and was perfectly mute in less than a fortnight, sang three parts in four of the nightingale's notes.

These birds are serviceable to mankind by the myriads of injurious insects which they devour.

They form their nests in thickets or holes of old buildings; and have from five to seven eggs of dull white colour sprinkled with reddish spots.

150. The SWALLOWS are a tribe of birds chiefly distinguished by their short and depressed bills, their long wings, and the tail being generally forked.

Only four species are found in this country. These are all migratory. The common or CHIMNEY SWALLOW (*Hirundo rustica*) usually appears about the middle of April, and departs about the end of October; the MARTIN (*Hirundo urbica*) appears in the beginning of March, and leaves us about the middle of October; the SAND MARTIN (*Hirundo riparia*) appears after the middle of March, and departs about the middle of September; and the SWIFT (*Hirundo apus*) appears before the middle of May, and departs in the beginning of September.

All the English species of swallow skim along the air in pursuit of flies, gnats, and other insects; which, if it were not for the all-wise ordination of Providence, in directing their regulation by supplying food to these and other species of birds, would soon fill the atmosphere and destroy all our comfort. Hence (to say nothing worse of it) we see how injurious it is to destroy these birds, as is frequently the case, for mere amusement, and under an idle pretext, by many persons of improving their skill in shooting game.

Chimney swallows are sold as food in the markets of France, Spain, and Italy.

151. The ESCULENT SWALLOW (*Hirundo esculenta*) is a very small bird, distinguished by being blackish above and whitish beneath, and having the tail tipped with white.

It is found in Sumatra, Java, and some other islands in the Eastern seas.

There is a great trade to China in the nests of these birds. They are of texture resembling isinglass, and are, in shape, somewhat like a saucer with one side flatted. Their thickness is little more than that of a silver spoon, and their weight from a quarter to half an ounce. They are very brittle, and have a shining gummy appearance internally when broken; and are wrinkled or slightly furrowed externally. The best and clearest of these nests are nearly as white as

writing paper, and, semi-transparent, having a few downy feathers hanging about them; but their general colour is white inclining to red. They are usually packed one within another, to the length of twelve or fifteen inches, and secured with split canes to prevent their breaking. The use to which they are principally applied is for the thickening of soups and broths, and to these they are said to communicate an exquisite flavour. Or, after having been softened in water, they are mixed with ginseng, and put into the body of a fowl, and the whole is stewed together, and constitutes a very favourite dish with the Chinese epicures. It has been calculated that the island of Batavia alone exports to China more than twelve tons' weight of these nests annually. A few are brought into Europe as curiosities and presents.

Sir George Staunton speaks of having seen great numbers of them in two caverns which ran horizontally into the side of a rock, in the Island of Cass, near Sumatra. They adhered to each other and to the sides of the cavern, mostly in rows, without any break or interruption. The nests are not taken until after the young ones are fledged; and, in general, this is done by persons who descend to the places where they are situated, by rope ladders.

152. *The WILD PIGEON, or STOCK-DOVE* (*Columba ænas*), is distinguished by its bluish plumage, the neck being of a glossy green colour above; by the wings being marked with two black bars, and the tip of the tail blackish.

These birds are in some degree migratory; large flocks of them arriving in England from the northern regions of the Continent at the approach of winter, and returning in the spring. Many of them, however, remain in this country during the whole year, and only change their quarters to procure food. Similar, but much more extensive, flights of wild pigeons are observed in some parts of Italy, where great numbers of them are caught for sale as food.

They build their nests in the holes of rocks, in old castles, churches, and towers, and sometimes in the hollows of trees, but never on the boughs; and they lay two white eggs.

The name of Stock-dove has been given to these birds, from their being the stock or origin of our *domestic pigeon*. In a domesticated state artificial cavities are formed for them to breed in; and they are frequently known to have young ones eight or nine times in the year. Thus, although they have only two eggs for each brood, their increase is sometimes extremely rapid.

The uses of pigeons in cookery are well known. The young ones only are selected for this purpose; and they are generally taken just before they are fledged.

There is a mode of enticing pigeons to resort to and reside in any place, by putting there what is called a "salt cat." This is made of loam, old rubbish and salt, and is a substance they are so fond of that instances have been known of farmers having thus deprived their neighbours of their whole stock of pigeons. But, by act of parliament, this practice is now rendered illegal. The shooting of pigeons is also an offence against the law. With respect to the formation of pigeon-houses, it may not perhaps be generally known that, although a lord of a manor may build them on his own land parcel of the manor, and a freeholder on his own ground, yet a tenant cannot do this without his lord's license.

Pigeons are generally considered an injurious stock to the farmer, as they subsist almost wholly on grain, and devour, in the course of a year, infinitely more than would amount to their own value.

There are more than twenty different varieties of the domestic pigeon, of which those called carriers, tumblers, croppers, and powters, are perhaps the best known.

153. The CARRIER PIGEON, which is easily distinguished from others by a broad circle of naked white skin round each eye, and by the dark bluish colour of its plumage, is remarkable for the celerity and certainty with which it has been known to convey letters from distant parts. This arises from the natural attachment which the birds have for the places where they have been bred. The mode of employing them is to take them to the spot whence intelligence is to be brought, to tie the letter under their wing, and let them loose. They rise to a great height into the air; then, by an unaccountable instinct, they dart onward in a direct line to their home. The rapidity of their motion is such that they have been known to fly at the rate of near thirty miles an hour.

154. *The RING DOVE (Columba palumbus) is a species of pigeon known by its cinereous plumage, the tail feathers being black on the hind part, the first quill feathers being whitish on the outer edge, and the neck white on each side.*

It is common in our woods, and is also found in most other parts of Europe.

These birds differ from the last in the habit of constructing their nests on the branches of trees, and particularly on those of the fir-tree, and not in holes of rocks and buildings. As they are of considerably larger size than the domestic pigeon, and, whilst young, are almost equally good for the table, several attempts have, at different times, been made to domesticate them, by hatching their eggs in dove-houses under pigeons; but it has always happened that as soon as they were able to fly, they have escaped to their natural haunts in the woods.

155. *The CROWNED PIGEON (Columba coronata, Fig. 33) is a bird about the size of a turkey, of blueish colour, with a crest four or five inches high upon its head, and the shoulders somewhat rust-coloured.*

It is found in New Guinea, and some of the adjacent islands.

By the inhabitants of New Guinea crowned pigeons are killed for food; and, from their great size, they often afford a very important supply. As they are easily domesticated, they are frequently reared in poultry yards in the East Indies; and their appearance there is highly pleasing and ornamental.

156. *The PASSENGER PIGEON* (*Columba migratoria*) is known by its long tail, the circles round the eyes being naked and blood coloured, and the breast being of reddish colour. These birds are found in different parts of North America.

Some idea of the immense numbers of passenger pigeons may be formed by stating that one continued flight of them is calculated by Mr. Weld to have extended at least eighty miles; and that a person is known to have killed more than a hundred and twenty at one shot with a blunderbuss. They migrate, at certain seasons, from one part of the country to another in search of acorns, berries, and other food. During these migrations they are very fat, and are either killed with clubs and guns, or caught in nets extended upon the ground, into which they are allured by tame pigeons, of their own species.

Passenger pigeons are brought, for sale, in sacksful to Quebec, where they are eagerly purchased as food. Such numbers of them are killed by the American Indians that they prepare their fat so as to be eaten like butter. And we are informed that some years ago there was scarcely any Indian town in the interior of Carolina in which 100 gallons of this fat might not at any time have been purchased.

It will easily be imagined, that, in every part of the country where these pigeons feed, they must prove, beyond all calculation, injurious to the farmer, by devouring the fruits of the harvest.

ORDER IV.—GALLINÆ, OR GALLINACEOUS BIRDS.

157. The *TURKEY* (*Meleagris gallo-pavo*) is found wild in the woods of America, and is distinguished by its forehead and chin having a red and naked skin, and the breast of the male being tufted.

Wild turkeys are hunted with dogs by the inhabitants of those parts of America where they are found. As soon as their haunts are discovered, the hunters send into the flock a dog that has been trained to this pursuit. The turkeys do not attempt to escape by flight, but run before him until they become fatigued, when they seek for safety in the trees. The dog gives notice to his followers of the places where they are concealed; and they are then easily knocked off the branches with poles, and secured.

Such is the size of these birds that they frequently weigh more than forty pounds each. The Indians not only esteem them as food, but make an elegant clothing of the *feathers*. The webs of these they twist, into a double string, with hemp or the inner bark of the mulberry-tree, and work or weave them somewhat like matting. The article thus produced is said to have a rich and glossy appearance, and to be as fine in texture as silk shag. The inhabitants of Louisiana make fans of the tails; and the French, in the American colonies, used formerly to construct parasols by joining four of these tails together.

It does not appear that turkeys were known in England anterior to the reign of Henry the Eighth; and it is supposed that the first of these birds which appeared in Europe were brought from Mexico, after the conquest of that country, in 1521.

These birds, in a domestic state, subsist on grain and insects, and breed early in the spring; the females, whenever they have opportunity, wander to a considerable distance from the poultry yards to construct

their nests, and lay and hatch their eggs. These are from fourteen to seventeen in number, of large size, and white colour, marked with reddish or yellow freckles. Young turkeys are so tender as to require much attention in rearing them. The housewives of Sweden frequently plunge them into cold water the day they are hatched; and, after having forced each of them to swallow a pepper-corn, restore them to the care of the parent.

Few birds are more in request for the table than these. The principal countries in which they are fed are Norfolk and Suffolk; and, about Christmas, the demand for them in London is so great that the coaches are sometimes laden with them, even to the exclusion of living passengers. Occasionally turkeys are driven along the roads in flocks of several hundreds together, the drivers having no other implement for keeping them in order, than a long stick with a piece of scarlet rag tied at the end, to which colour they have a very extraordinary antipathy.

158. *The PEACOCK (Pavo cristatus) is a well-known bird, a native of the woods of the East Indies and other parts of Asia, as well as of several parts of Africa.*

It is peculiarly distinguished by having on its head a crest of twenty-four feathers, and a single hard spur at the back of each leg. The male has, over its tail, several feathers, sometimes four or five feet in length, and each marked, at the extremity, with an eye-like spot: the real tail consists of a range of short, brown, and stiff feathers, which are beneath these.

In some parts of the East Indies the shooting of wild peacocks is not an uncommon diversion, and the size and heavy flight of the birds are such that it does not require a good marksman to bring them down.

Peacocks are mentioned, in the Sacred Writings, as constituting part of the cargoes of the fleet which conveyed the various treasures of the East to the court of King Solomon. They were so much esteemed for the table, by the Romans, that one person, who had devised a mode of fattening them, obtained thereby

alone an annual income equal to about 500*l.* of our money. In England these birds were formerly introduced at sumptuous dinners, and sometimes the skin and all the feathers, particularly those of the tail, were kept to serve them up in. The flesh of the old birds is coarse and unfit for food; but young pea-fowls are at this day much esteemed by epicurés.

The *train feathers* of the peacock are used among the Chinese for ornamental work of different kinds, and particularly for decorating the caps of the mandarins; and they are an article of traffic from the East Indies to that country. Peacocks' *crests*, in ancient times, were among the ornaments of the kings of England; and it appears from records that, in fines to the crown, these crests were sometimes among the articles to be paid.

Pea-fowls are fed in the same manner as turkeys (157); and the females, when allowed to range at liberty, always deposit their eggs in some sequestered place. These birds are very injurious in gardens, from their scratching up the ground in search of food. They love to perch on the highest trees; and their voice is a harsh scream in two notes, one of which is an octave of the other.

159. *The COMMON PHEASANT* (*Phasianus colchicus*, Fig. 34) is distinguished by the general reddish chesnut colour of its plumage, its head and neck being blue, and each eye being surrounded with a red, naked, and warty skin.

There is a small and moveable tuft of feathers on each side of the head. The plumage of the female is much less brilliant and beautiful than that of the male.

These birds, though now found wild in our woods, are supposed to have been originally brought into Europe from the banks of the *Phasis*, a river of *Colchis*, in *Asia*, situated to the East of the *Black Sea*. Pheasants are also found in other parts of *Asia*, and in *Africa*.

These birds constitute a rich and wholesome nutriment. They breed in woods and fields, forming their nests, upon the ground, in places where the herbage is thick and close; and laying from twelve to fifteen eggs.

These are sometimes taken away and committed to the care of poultry hens, which will hatch them, and rear the young ones as their own. Pheasants feed on corn, wild berries, beech-mast, acorns, and other similar food. They roost on the branches of trees, and, in the short days of winter, generally fly into them for this purpose about sun-set; the male birds making a noise, which they repeat three or four times successively, called "cocketing," and the hens uttering one shrill whistle. Poachers, well acquainted with these sounds, easily discover the place, and either shoot them on their perch, bring them down by burning sulphur underneath, or catch them by a snare made of brass-wire, and fixed to the end of a long pole. They are also caught by snares placed in tracks through which they are known to run, towards the adjacent fields, to feed.

If noblemen and gentlemen of extensive landed property did not preserve the breed of pheasants by forbidding them, except under certain regulations, to be destroyed, the race would soon be extinct in this country.

160. *The ARGUS PHEASANT (Phasianus argus) is a splendid bird, of pale yellow colour, spotted with black, the feathers of the wings grey, with eye-like spots; and the two middle feathers of the tail very long, with similar spots.*

It is a native of Chinese Tartary, the island of Sumatra, and other parts of the East, and is about the size of a turkey.

The beauty of the plumage of the argus pheasants, but particularly of their wing feathers, and the two long feathers of the tail, has rendered them objects of considerable attention. These feathers were, some years ago, in considerable request in England as an ornament in female-head-dress; but from their natural stiffness both of texture and appearance, they are at present but little regarded.

In their native country these birds are killed as food, their *flesh* being as much esteemed as that of the common pheasant is with us.

161. *DOMESTIC POULTRY* (*Phasianus gallus*, Fig. 35) are birds of the pheasant tribe, and found in a wild state in some of the forests of India, and the Indian islands.

There are few birds so important to mankind as these. Whilst living, they supply us with eggs; and when dead, their bodies afford us food, and their feathers are useful for making beds.

It is said that hens will sometime lay as many as two hundred eggs in twelve months. The chickens are naturally produced by the warmth of the parents sitting upon them, and generally in about three weeks after the operation has commenced. In Egypt, however, it is customary to hatch chickens in ovens by artificial heat. These ovens are sometimes so large as to contain from 40,000 to 80,000 eggs; and it has been calculated that more than 100,000,000 of chickens are annually brought to life in this manner. A similar mode of hatching them was, some years ago, introduced into France by M. de Reaumur; but the practice does not appear to have been much followed.

Some villages in Sussex are famous for poultry, which are fattened to a size and perfection not known elsewhere. They are fed on ground oats made into gruel, by a mixture with hog's grease, sugar, pot-liquor, and milk; or on ground oats, treacle, suet, &c. They are kept warm, and crammed for about a fortnight before they are sold to the higlers. The cramming is performed by rolling their food into pieces of sufficient size to be passed down their throats. When full grown these fowls weigh six or seven pounds, and are sold at four shillings and sixpence or five shillings each. What are called *Darking fowls* are a very large breed which are also reared in Sussex.

To ascertain whether eggs are fresh, some persons hold them up against a strong light, to see that the white has not lost its transparency; others put their tongue to the large end, and if this feel warm they are considered to be good. If, on shaking them, they

are heard to rattle, they are bad. It is said that eggs may be preserved, for many months, by being covered with a thin coat of mutton suet, or other fat substance; but perhaps a better mode than this would be to cover them with a cheap varnish, by which, as well as by the fat, the air would be prevented from penetrating the shells, and thereby rendering the eggs putrid.

Eggs are an agreeable and nourishing food, and are used in various ways in cookery. The whites are of use in medicine. They have been employed with advantage in burns, and have been recommended as a specific for the cure of jaundice. They are likewise used by gilders and artisans. The yolks are employed in medicine in several different ways, but most frequently in emulsions. The shells of eggs serve for various purposes, but chiefly as a white colour, in painting, which is considered preferable to that called flake white.

The *feathers* of poultry are used, to considerable extent, for making beds, pillows, and bolsters; but they are by no means so excellent as those of geese.

162. *The GUINEA-FOWL, GALLINA, or PINTADO* (Numidia meleagris), is an African bird, which is now domesticated in most parts of Europe, and is known by the red or bluish wattles, under the throat, a naked protuberance on the head, their slender neck, and beautifully spotted plumage.

The flesh of Guinea fowls is tender and sweet, and, by some persons, is thought to resemble that of the pheasant. In Guinea and the adjacent parts of Africa, their native country, where they are not unfrequently seen in flocks of two or three hundred together, they are hunted and caught by dogs. These birds chiefly delight in marshy and morassy places, and subsist on insects, worms, and different kinds of seeds. Their eggs are a very delicate food.

Guinea fowls were originally introduced into England somewhat earlier than the year 1260, and they are now

common in our poultry yards. The females always endeavour to lay their eggs in some concealed situation; and the chicks, when hatched, require warmth and quiet, and should, for some time, be fed on rice swelled with milk, or with bread soaked in milk.

These are restless and clamorous birds, and have a harsh and, to some persons, an unpleasant cry, which consists of two notes, sounding like "camac, camac, camac," frequently repeated.

163. *The RED GROUS, or RED GAME* (*Tetrao scoticus*, Fig. 36), is a species of feathered game from fifteen to nineteen ounces in weight, which has its plumage beautifully mottled with deep red and black, and the six outer tail feathers blackish.

Over each eye is an arched and naked scarlet spot, and the feet are feathered to the claws.

This bird inhabits the mountainous heaths of Derbyshire, Yorkshire, Wales, and Scotland.

It is generally supposed that red grouse are peculiar to the British Islands. They are found in "packs," consisting sometimes of forty to fifty birds; and are an object of eager pursuit by sportsmen. They principally frequent high and heathy grounds, where they feed on mountain berries and the tops of heath; and they seldom descend into the valleys. The birds are eaten roasted, like most other game, but they are sometimes potted, and are in general much admired for the table.

Red grouse have been bred, and successfully reared, in confinement, by supplying them almost every day with fresh pots of heath.

164. *BLACK GROUS, or BLACK GAME* (*Tetrao tetrix*, Fig. 37), is a species of feathered game of violet black colour, with the tail forked, and the secondary quill feathers white towards the base.

Its weight is from two to four pounds. These birds are found in mountainous and woody parts of the north of England; and in the New Forest, Hampshire; in Scotland, and several countries of the Continent.

The pursuit of this and other species of grouse is a much more important occupation in the northern parts of the Continent than it is in this country. In some parts of Russia they are caught in traps of wicker-work baited with corn. Huts full of loop-holes are sometimes formed in woods that are frequented by them, and upon the adjacent trees artificial decoy-birds are placed. The persons in the huts fire upon the grouse as they alight, being careful to kill those first which are upon the lower branches; and, in this case, so long as the men are concealed, the report of the guns does not alarm the birds.

These birds feed on mountain fruits, and in winter on the tops of heath; and, although they always roost on trees, they form their nests on the ground. Each female lays six or eight eggs, of dull yellowish white colour, marked with numerous small rust-coloured specks, and towards the smaller end with some blotches of the same colour. The young male birds quit their parents in the beginning of winter, and usually associate in small packs until the spring. Black grouse will live and thrive, but they have not been known to breed, in aviaries.

165. *The PTARMIGAN, or WHITE GAME* (*Tetra lagopus*, Fig. 38), is a species of grouse which, in summer, is of pale brown colour, elegantly mottled with small bars and dusky spots; and has the bill and the tail feathers black. In winter it is almost wholly white.

These birds, which are somewhat larger than a pigeon, are inhabitants of the extreme northern countries of the continents both of Europe and America. They are also found among the mountains of Scotland, and are sometimes seen in the alpine parts of Westmoreland and Cumberland.

By the inhabitants of Greenland not only the flesh but even the intestines of these birds are much esteemed as food. The skins, with the feathers on, are made into clothing; and the black tail feathers were formerly much in request among this people for female head-dresses.

So numerous are these birds in the northern parts of America, as, at the commencement of winter, to assemble in flocks of 150 or 200 in number; and more than 10,000 have, in some years, been caught near Hudson's Bay, betwixt the months of November and May. They are killed in various ways; by snares, with nets, and with guns; and indeed so fearless are they of the approach of mankind that they may be knocked down with sticks or clubs. Instances have occurred of their having been driven, almost like poultry, into nets or snares that have been laid for them.

In our own country these birds associate in small packs, and live among rocks, perching on the stones, and, when alarmed, taking shelter beneath them. They feed on mountain berries, the buds of trees, and the young shoots of the heath. The females form their nests on the ground, and lay in them from six to ten eggs, which are of a dusky colour with reddish brown spots.

It is a very extraordinary ordination of Providence, that these birds at the commencement of winter should assume a white plumage, by which, being incapable of defence, they are able, amidst the winter's snows, to elude the pursuit of their enemies. And not only this; but, as an additional protection against the cold, all the feathers except those of the wings and tail are now doubled.

As food, these birds are said very much to resemble the red grouse in flavour.

166. *The WOOD GROUS, or CAPERCAILE* (Tetrao urogallus), is a bird nearly as large as a turkey, its plumage varied, but bay above, marked with blackish lines; the tail rounded, and the under parts at the base of the wings white.

This bird is found in the northern parts of Europe and Asia; and (though very rarely) in the Highlands of Scotland north of Inverness.

There can be no doubt but, in ancient times, these birds were common in the mountainous parts of South

Britain. In countries where pine forests are numerous, they feed on the buds of fir-trees; and on the young cones, so as sometimes to render the taste of their flesh extremely unpalatable. They are also partial to the berries of the juniper.

The females form their nests on the ground, and lay from eight to sixteen eggs, which are of a white colour spotted with yellow.

167. *PARTRIDGES* (*Tetrao perdix*) are particularly distinguished by having, under the eyes, a naked scarlet spot; the tail rust-coloured, the breast brown, and the legs of light colour.

These birds are found in nearly all the countries of Europe, and in many of the temperate parts of Asia.

In the autumn and winter, partridges are generally found in coveys, as they are called, of ten or fifteen birds, consisting of the parents and their brood. They are killed, by sportsmen, in immense numbers, for the table; and in all the ways in which they are cooked they are an highly esteemed food.

Partridges are remarkable for never perching nor alighting on trees. They live in cultivated lands, constructing their nests upon the ground, and having usually from fifteen to eighteen eggs. These are hatched towards the beginning of June, and the young ones are able to run as soon as they come into the world. If the eggs happen to be destroyed, the female will, in many cases, form another nest, and produce a second offspring. The birds of this brood are not perfectly fledged till the beginning of October; and are always a puny race. If the eggs of partridges be placed under a common hen, she will hatch them, and rear the young ones without difficulty. But these, after they are grown, almost always escape into the fields and become wild. It is said that the inhabitants of Scio, one of the islands of the Grecian Archipelago, rear large flocks of partridges, which, during the day, are permitted to visit the fields, and in

the evening always return home to roost. At the commencement of the breeding season they abscond for some time; but, after having hatched their coveys, they return with their families to the farm-yard.

The attachment of partridges to their offspring, and the stratagems which they adopt to draw off the attention of their enemies whilst these seek their safety by flight or concealment, are well known to almost all persons who are resident in the country.

It is usually considered that the dark-coloured feathers on the breast of the partridge are peculiar to the male; but it has been ascertained beyond a doubt that these are also common to the female. The males can be distinguished from the females only by a superior brightness of the plumage about the head.

168. *The QUAIL (Tetrao corturnix) is a bird considerably smaller than, but much resembling, the partridge: its form, however, is more slender, the body is spotted with grey, the eyebrows are white; and the tail-feathers have a rust-coloured edge and crescent.*

These birds are found in some parts of England; but in other countries of Europe, as well as in several districts of Asia and Africa, they are extremely numerous.

Quails are migratory birds, generally arriving in this country betwixt the middle of August and the middle of September, and departing in April. They are greatly esteemed for the table; and are usually eaten roasted (without being drawn), and served on toast, in the same manner as woodcocks. So numerous are they, in many countries of the Continent, that they may be purchased, even by dozens, at a very low price. In some parts of Italy thousands of quails are caught in a day, at the periods of their migration. The Russians also take them in immense numbers, and, packing them in casks, send them for sale to Petersburg and Moscow. We formerly imported great numbers of these birds alive from France. They were conveyed, by the stage coaches, in large square boxes, divided into five or six compartments one above another, and just high

enough for the birds to stand upright, each box containing about a hundred quails. These boxes had wire in front, and each partition was furnished with a small trough for food. The object of this importation was solely for the table.

So irritable is the disposition of the quail, that, whenever the males are kept together, they always fight. This propensity rendered them esteemed by the ancient Greeks and Romans, for the same purposes as game-cocks are by many of the moderns. The fighting of quails is, at this day, a fashionable diversion with the Chinese, and in some parts of Italy. The ancients did not eat these birds, under a supposition that they were an unwholesome food.

Quails are not so prolific as partridges. They seldom have more than six or seven eggs, which are of whitish colour marked with ragged rust-coloured spots.

169. *The BUSTARD* (*Otis tarda*, Fig. 39), *the largest land bird which is produced in England, is distinguished by its plumage being waved and spotted, with black and dusky, and whitish beneath; and the bill being convex and strong, with a tuft of feathers on each side of the lower mandible.*

These birds are about four feet in length, and are found in small flocks on open plains of different countries of Europe, Asia, or Africa. They were formerly seen on Salisbury Plain in Wiltshire, and other parts of England; but, in consequence of the enclosures which have of late years been made, the breed is supposed to be nearly extinct in this country.

When these birds were more numerous than they now are, they were hunted by grey-hounds for amusement, and, as they run with great rapidity (seldom being known to rise on wing), the chase was sometimes very long.

Their flesh has been compared to that of the turkey, and epicures on the Continent are stated to prefer the thigh of the bustard to most other kinds of game.

Such is the timidity of these birds that they seldom allow any person to approach within gun-shot of them. They fly slowly, and have some difficulty to rise from

the ground; but, when in flight, they are able to continue their course for many miles without resting. Bustards feed on green corn and vegetables; and on worms; frogs, mice, and other animals. They form no nest, but the female lays her eggs, two in number, on the ground. The eggs are as large as those of a goose, and of pale olive-brown colour, marked with brown spots.

170. The OSTRICH (*Struthio camelus*, Fig. 40) is a bird of immense height, measuring from seven to nine feet from its head to the ground; and is distinguished by its extremely long neck, somewhat conical bill, the wings not being formed for flight, and the feet having each only two toes.

It inhabits extensive plains and deserts in the torrid regions of Asia and Africa.

Ostriches are pursued by the Arabs principally on account of their feathers, which are a considerable article of traffic. This people use the fat of these birds in cookery; and they occasionally subsist upon the flesh.

The eggs of the ostrich are of large size, and, in the South of Africa, are considered a great delicacy. They are prepared for eating in various ways; but the best way is simply to bury them in hot ashes, and, through a hole made in the larger end, to stir the contents till they acquire the consistence of an omelet. Ostriches' eggs are capable of being preserved for a great length of time even at sea; and without any trouble of constantly turning them, as is requisite with hen's eggs. This is owing to the great thickness of the shells. At the Cape of Good Hope they are usually sold at the rate of about sixpence sterling each. The Egyptians suspend the shells of these eggs as ornaments, under the vaulted roofs of their houses; and they are frequently hung between lamps in the mosques of the Mahometans, and also in the Greek and Coptic churches. The shells are cut by the Hottentots into necklaces, bracelets, and ornaments for the waist. In the eggs of the ostrich are frequently found a kind of small oval-shaped stones about the size of a marrow-

fat pea, which are sometimes set and used for buttons. The *skins* of ostriches are employed by the Arabians as a substitute for leather.

But no parts of the ostrich are so valuable as the *feathers* of the wings and tail. These are divided into loose and silky filaments, and are most admired when plucked from the birds whilst alive. They are packed in bundles by the Arabs, who put them, large and small, good and bad, together for sale. In Europe they are used for female head-dresses; and for this purpose the shortest and lightest are most esteemed. The ostrich feathers that are imported into this country from the Cape of Good Hope are not considered so good as those which we receive from Barbary; they are of better colour, but not so perfect in the flue or feather, and are thin and irregular. There is a permanent tax of 1*l.* 15*s.* and a war tax of 1*l.* 8*d.* per pound on all ostrich feathers which are imported into England.

Two, three, or sometimes four ostriches deposit their eggs, thirty or forty in number, in the same hollow place in the sand; and they do not, as is generally supposed, leave them entirely to the heat of the sun to be hatched. These birds are sometimes reared in a domestic state.

ORDER V.—WADERS, OR GRALLÆ.

171. The COMMON or WHITE STORK (*Ardea ciconia*) is a bird distinguished by its strong and sharp red bill, its white plumage, and the orbits of the eyes and the quill feathers being black. The feathers of the breast are long and pendulous.

This bird is upwards of three feet in length. It is found in every quarter of the world, except America; and, though rarely seen in England, is extremely common in Holland and some other parts of Europe. It is a bird of passage, and leaves Europe in the autumn for Egypt, Barbary, and some of the countries of Asia.

The Mahometans have the highest veneration for the stork; and any person would be held in abhorrence

who attempted to kill or even to molest these birds. They frequent the streets of the most populous towns, where they devour offal and filth of almost every kind; and, in fenny countries, they are of great service by feeding upon noxious reptiles and insects. In ancient Thessaly it was a crime expiable only by death to kill one of them.

Storks are easily tamed and rendered domestic, and may be trained to reside in gardens, which they soon clear of frogs, toads, and other reptiles. In a wild state they make their nests of sticks and dried plants, on lofty trees or the summits of rocks. The inhabitants of Holland frequently place boxes on their houses for them to build in.

The *quills* of the stork are large, and make excellent pens for writing with.

172. *The COMMON HERON* (*Ardea major*, Fig. 41) is a bird of the stork tribe, distinguished by the cinerous colour of its plumage, by the male having a long and pendent crest on the hind part of the head, the feathers of the neck long; and by having a double row of black spots on the neck.

This bird, which is somewhat more than three feet in length; is common in most of the fenny parts of Great Britain.

A few centuries ago heronies were nearly as common in the neighbourhood of noblemen's houses as rookeries. These birds, like rooks, delight in building their nests in society, and on the highest trees. As many as eighty herons' nests are mentioned by Mr. Pennant, to have been counted on a single tree at Cressi Hall, near Gosberton in Lincolnshire.

When heron hawking, or the pursuing of these birds with falcons, was a favourite diversion in this country, great attention was paid to the preservation of the breed. They were ranked among royal game, and were so far protected by the laws, that any person destroying or shooting at one of them was liable to a penalty of twenty shillings. A penalty of ten shillings was exacted for taking young herons from the nest;

and any one taking or destroying the eggs, betwixt the twenty-first of March and the thirteenth of June, was punishable by twelve months' imprisonment, and a forfeiture of eightpence for every egg so taken. These birds were formerly as much esteemed for the table as pheasants are now, and no fewer than four hundred herons are stated to have been served up at Archbishop Neville's inthronization feast, in the reign of Edward the Fourth.

Plumes formed of feathers of the heron and egret are used as ornaments for the caps of knights of the garter.

Hérons subsist chiefly upon fish, and are very destructive in fish-ponds. It has been calculated that a single heron will destroy nearly 3000 carp in a year. These birds take their prey by wading into the water, and seizing the fish as they pass by: they also sometimes catch them in shallow water by darting from the air, and securing them against the bottom.

173. *The BITTERN* (*Ardea stellaris*, Fig. 42) is a bird of the stork tribe, distinguishable by its brownish yellow plumage, variously marked with black; by the feathers of the neck and breast being peculiarly long; and the bill being strong, of brown colour above, and greenish beneath.

This bird is not quite so large as the heron. It is found in marshes of several parts of England, as well as on the continents of Europe, Asia, and America.

The *flesh* of the bittern was formerly much esteemed at the table. Amongst other provisions at Archbishop Neville's inthronization feast, there appear to have been 204 bitterns. These birds are now sometimes to be seen in the poulterers' shops in London, where they are generally sold for about half-a-guinea each. The *hind claws* were once in esteem as tooth-picks, from an opinion that the use of them tended to preserve the teeth from decaying.

Few birds of their size are more strong, or, when attacked, are more ferocious than these. They subsist chiefly on fish, frogs, mice, and other animals. During

the months of February and March the males, in the mornings and evenings, make a kind of deep, lowing noise, which is supposed to be their call to the females. These birds form their nests among rushes, and generally lay four or five greenish brown eggs.

174. The CURLEW (*Scolopax arquata*, Fig. 44) is a bird known by having a long arched black bill, bluish legs, and blackish wings, with snowy spots and marks.

Its general weight is betwixt twenty and thirty ounces.

In winter large flocks of these birds are seen on our sea-coasts, and in summer they often retire into mountainous parts of the interior of the country. They are found in Europe, Asia, and Africa.

Curlews are frequently shot for food, and sometimes are very palatable, particularly if killed at a distance from the sea; but such as are killed near the sea-coasts have often a fishy and bad taste.

They feed on marine and other worms and insects, and build their nests upon the ground in unfrequented places distant from the coast, laying four eggs, which are of a pale green or olive colour, marked with irregular brown spots.

175. The WOODCOCK (*Scolopax rusticola*, Fig. 45) is a bird with varied plumage, a long straight bill reddish at the base, legs ash-coloured, the thighs clad with feathers, and the head with a black band on each side.

The weight of the woodcock is generally about twelve ounces.

These birds are migratory, and usually begin to arrive in England about the first week in October, and depart about the middle of March.

The woodcocks which arrive in the southern parts of England, probably come from Normandy; and those in the northern parts from Sweden. The latter appears evident by the time of their departure from Sweden exactly coinciding with that of their arrival in Britain, and their retreat from this country coinciding with their re-appearance there. In their migrations they chiefly

fly during the night, and arrive in greatest numbers with north-easterly winds and during foggy weather.

Few birds are so much in esteem for the table as these; and they are fattest, and consequently in best condition, during the months of December and January. Before they were protected by the game laws, it was customary, in some of the northern parts of England, to catch woodcocks by traps. Long parallel rows of stones or sticks, four or five inches high, were made in moonlight nights on the commons frequented by them. In these rows several intervals or gateways were left in which the traps were placed. When the birds, running about in search of food, came to one of these rows, they did not usually cross it, but ran along the side till they arrived at the gateways, which they entered, and in which they were caught. Notwithstanding the high opinion entertained by British epicures respecting the woodcock for the table, we are assured that the inhabitants of Sweden, Norway, and other northern countries, wholly reject them, under a notion that they are unwholesome. They, however, eat and are particularly partial to the *eggs* of the woodcock. These are carried for sale, in great numbers, to the markets of Stockholm and Gottenburg.

In commencing its flight this bird rises heavily from the ground, and makes a flapping noise with its wings. It does not long continue in flight, and stops so suddenly as to fall apparently like a dead weight. A few moments after being on the ground it runs swiftly, but soon pauses, raises its head, and casts a glance around before it ventures to lurk in concealment under the herbage or bushes.

Woodcocks are seldom known to breed in this country. Those very few, however, that happen to remain, after the great flights have departed, construct their nests on the ground, generally at the root of some tree, and lay four or five eggs of rusty colour marked with brown spots. They feed on worms and insects.

176. *The COMMON SNIPE* (*Scolopax gallinago*, Fig. 43) is a small bird, with long straight bill, brown legs, the plumage varied with blackish and tawny colour above, and white beneath; and the front marked with four brown lines.

These birds, which usually weigh about four ounces, are found in marshy places in most parts of the world. They are migratory, a considerable portion of them leaving Great Britain in the spring of the year and returning in the autumn. Many, however, continue with us through the whole year.

Snipes, on account of their delicate flavour, are in great request for the table. But as, like woodcocks (175), they are eaten with their entrails, which contain many stimulant insects, &c. it has been supposed that a frequent indulgence in such food is apt to induce the gout, or at least to accelerate its paroxysms. It is remarkable respecting these birds that, though generally fat and rich eating, they seldom cloy even the weakest stomachs.

In winter they usually continue near marshy grounds, concealed among rushes and thick herbage; but, during severe frosts, they resort to sheltered springs, unfrozen boggy places, or any open streams of water. In summer they disperse throughout the country, and are occasionally found even among the highest mountains. When roused by the sportsman they utter a feeble whistle, and generally fly off, against the wind, in a zigzag direction. Snipes are fattest and in best season in November and December.

These birds feed on small worms, slugs, and insects. They form their nests of dried grass and feathers, in concealed and inaccessible parts of marshes, and have each four eggs of a dirty olive colour marked with dusky spots.

177. *The RUFF and REEVE* (*Tringa pugnax*, Fig. 46) are the male and female of a species of sandpiper, which have very varied plumage, the face coloured with yellow pimples, the three lateral tail feathers without spots, and the covert feathers of the wings brown, inclining to ash-colour.

The males, or ruffs, have, round their heads, after they are twelve months old, a very singular arrangement of long feathers, which drop off every year at the season of moulting. The female, or reeve, has no feathers of this description. The weight of the ruff is generally more than seven ounces, and that of the reeve about four.

These birds are found in the fens of Lincolnshire, Cambridge-shire, and Yorkshire.

In the early part of spring they begin to appear in the fens, and they disappear about Michaelmas. These birds are caught in nets, and a skilful fowler has been known to catch six dozen in one morning. In general the males only are taken, the females being allowed to escape on account of their smaller size, and that they may be left to breed. When caught they are generally put up, for some days, to be fattened; and for this purpose are fed with boiled wheat, and bread and milk mixed with hempseed, to which sugar is sometimes added. By this treatment, in the course of a fortnight, they become excessively fat. The usual mode of killing them is by cutting off their head with a pair of scissars. They are cooked, like woodcocks, with their intestines, and, when in perfection, are esteemed by epicures a most delicious food.

It is a very singular habit of the males, which are much more numerous than the females, to take possession each of a small piece of ground, upon which they run in a circle until all the grass is worn away. These *hills*, as they are called by the fowlers, are near each other; and as soon as a female alights, all the ruffs of the neighbourhood immediately begin to fight for her. It is during this contest that the fowlers seize the opportunity of entangling them in their nets.

The reeves form their nests of a few straws and dried grass loosely put together upon the ground; and lay each four white eggs marked with large rust-coloured spots.

178. *The LAPWING, or PEE-WIT* (*Tringa vanellus*), is a well-known marsh bird, which has a crest at the back of the head, the upper part of its plumage green, the breast black, and the legs red.

Its general weight is seven or eight ounces. This bird frequents moist heaths and marshy grounds in nearly all the temperate parts of Europe, Asia, and Africa.

The name of Lapwing has been given to these birds, on account of the flapping noise which they make with their large wings during flight; and that of pee-wit has been obtained from their cry. They associate in flocks during the winter-time, and are caught, by nets, in the same manner as ruffs (177), but are killed as soon as they are caught. Lapwings are in considerable demand by the London poulterers, particularly about the month of October, when they are fat and excellent eating. Their eggs, which are olive-coloured spotted with black, are esteemed a peculiar delicacy during the whole season in which they can be obtained.

Lapwings feed chiefly on worms, and the females lay each two eggs on the ground, in some hollow place, on the dry parts of marshes.

179. *The DOTTEREL* (*Charadrius morinellus*) is a species of plover distinguished by its roundish and obtuse bill and black legs, its breast being rust-coloured, and by having a white line over each eye, and another upon the breast.

These birds seldom weigh more than three or four ounces. About the latter end of April, during the month of May, and part of June, they are found, in flocks of eight or ten together, on the heaths and moors of Cambridgeshire, Lincolnshire, and Derbyshire, and among the mountains of Westmorland and Cumberland. They are also seen on the Wiltshire and Berkshire downs in the months of April and September.

Such is the singularity of manners of these birds that it is possible to catch them, even with the hand, by a very simple artifice. It was formerly customary for the fowler to proceed, in the night, with a candle and

lantern, to the places where he knew the birds were in the habit of roosting. Roused, but unalarmed, by the light, if he approached with caution they would continue immoveable until he was able to discover them. He would now stretch out one of his arms, which induced the imitative birds to stretch their wing; then a foot, which the birds likewise mimicked. This he did alternately until he was sufficiently near to extend and entangle them in his net. There were other contrivances besides this: but the greater facility of killing these birds by the gun has of late years rendered them all useless.

When dotterels are best in season they are very fat and delicate eating.

There are several birds which are sold by the London poulterers under the appellation of *plovers*. These are chiefly the GOLDEN PLOVER (*Charadrius pluvialis*), the GREY SAND-PIPER (*Tringa squatarola*), and the GREEN SAND-PIPER (*Tringa ochropus*), all of which are much esteemed for the table.

180. *The LAND-RAIL, or CORN-CRAKE* (*Rallus crex*), is distinguished by having a short and strong bill, and the legs situated far back; the feathers of the back black, edged with bay, and the wings of a reddish rusty colour.

The usual weight of these birds is from six to eight ounces. They are found, during summer, in corn-fields, but are migratory, and seldom seen after the middle of September.

The remarkable cry of "crek, crek, crek," uttered by these birds in meadows and corn-fields before the grass and corn are cut, is well known. It is heard from the thickest part of the herbage: and, when any person approaches the spot, so great is the rapidity with which they run, that it is, almost in an instant afterwards, heard forty or fifty paces distant.

When pursued by dogs, these birds persist in keeping upon the ground, and they may sometimes be taken even with the hand. They often stop short and squat, and the dog, overshooting the mark, loses his trace.

When driven to the last extremity they rise, but they fly heavily, and generally with their legs hanging down. They do not fly far before they alight: they then run off, and, before the sportsman can reach the place, are at a considerable distance. Sometimes the land-rail will alight upon a hedge, in which case it will perch and sit motionless till the pursuer (who thinks it is upon the ground) almost touches it.

When they first appear these birds are quite lean, but, before their departure, they become so fat that the author of *Rural Sports* informs us he has frequently been obliged to wrap his handkerchief round them, when killed, to prevent the fat which exuded from the shot-holes from soiling other birds.

The females lay twelve or more eggs of reddish cinereous white colour, marked with rusty and ash-coloured spots and blotches. The nest is loosely formed of moss or dry grass, generally in some hollow place among thick grass.

ORDER VI.—SWIMMERS, OR ANSERES.

181. *The WILD SWAN, or HOOPER* (*Anas cygnus*), is distinguished from the tame swan (182) by having the cere or naked skin at the base of the bill yellow and not black; and being of smaller size.

These birds are found in the northern parts of Europe, Asia, and America.

On several of the lochs or lakes of Scotland wild swans are very numerous; and they are known, at a great distance, by their cry, which is not much unlike the sound of a clarionet blown by a novice in music.

About the month of August these birds change their feathers, during which, in some countries, they are killed with clubs or hunted by dogs. Their *flesh* is esteemed a wholesome and palatable food, and the *eggs* are considered peculiarly delicious. Of the *skins*, which are used in England, with the down upon them, for muffs, tippets, and powder-puffs, the inhabitants of Iceland and Kamtschatka make garments of different kinds.

The North American Indians sometimes weave the down into ornamental dresses; and form the large feathers into caps and plumes to decorate the heads of their warriors.

182. The TAME SWAN (*Anas olor*, Fig. 47), the largest of all British birds, is distinguished from the wild swan (181) by its larger size, and by the cere or naked skin at the base of the bill being black and not yellow.

It is an inhabitant both of Europe and Asia.

So highly were these beautiful and stately birds esteemed by our ancestors that, by an act of Edward the Fourth, no person who possessed a freehold of less yearly value than five marks was permitted to keep them. At this day the stealing of swans is considered a felonious act; and there is a penalty for stealing the eggs, of twenty shillings each.

Swans were formerly served up at almost every great feast. At Archbishop Neville's feast in the reign of Edward the Fourth, there were no fewer than 400 of these birds. At present, the *cygnets*, or young swans, only are eaten. Considerable numbers of these are annually fattened near Norwich, about Christmas, and chiefly for the table of the corporation of that city.

The nest of the swan is formed, about the month of February, of grass, and generally among reeds near the water. The eggs are six or eight in number, of large size and white colour.

183. The WILD GOOSE (*Anas anser*) is distinguished by having a somewhat cylindrical bill, the body ash-coloured above and paler beneath, and the neck striate.

Large flocks of wild geese frequent all the fenny districts of England, and are also found in the northern parts of the continents of Europe, Asia, and America.

These birds are killed on account of their *flesh*, which is an excellent and nutritive food; and they are the stock from which our common or tame geese have been obtained.

Vast numbers of the latter are kept in the fens of Lincolnshire, and other parts of England, and chiefly for the sake of their quills and feathers. Of these they are unmercifully stripped, whilst alive, once every year for the former, and five times for the latter. The *quills*, or large feathers of the wings, are termed firsts, seconds, and thirds, from the order in which they grow. The last two kinds are those principally used in writing, on account of the larger size of their barrels. And as the utility and value of quills, in the making of pens, greatly depend on their firmness and elasticity, different expedients have been contrived to harden them. The most simple of these is to thrust the barrels, for a few moments, into hot sand or ashes, afterwards to press them almost flat with a penknife, and then to restore their roundness by the fingers, with the assistance of a piece of leather or woollen cloth, removing at the same time their external roughness by the friction. But when great numbers are to be prepared, other methods are adopted. Aqua-fortis is frequently employed in the preparation of quills, by which they are stained a yellow colour.

All the best *feathers* that are used in this country for making beds, bolsters, and pillows, are those of geese; and such as are obtained in the county of Somerset are generally esteemed the best. Great quantities of goose and other feathers are annually imported from the north of Europe; but these being insufficient for the demand, the feathers of cocks and hens, and also of ducks and turkeys, all of which are much inferior to those of geese, are frequently mixed with them. The best mode of preserving feathers is to expose them, in a room, to the rays of the sun; and, as soon as they are thoroughly dried, to put them loosely into bags, in which they should be well beaten to cleanse them from dust and filth. Of late years feathers have been manufactured into hats.

The usual weight of a fine goose is fifteen or sixteen pounds, but it is scarcely credible how far this weight

may be increased, by cramming the birds with bean-meal, and other fattening diet. In some places it is customary to nail them to the floor by the webs of the feet, to prevent any possibility of action, and thus to fatten them the more readily. In Vienna the *livers* of geese are esteemed a great delicacy. They are eaten stewed, and some of the German poulterers have a method of making them grow to an enormous size.

In the choosing of geese for the table, care should be taken that the feet and legs be yellow, which is an indication of the bird's being young: the legs of old-geese are red. If recently killed, the legs will be pliable, but if stale they will generally be found dry and stiff.

These birds are denominated *green geese* until they are three or four months old; and, at this immature age, they are held by many persons in great esteem for the table.

Besides the present, there are several other species of goose, which are useful on account of their quills and feathers, and likewise as supplying mankind with food.

184. *The WILD DUCK* (*Anas boschas*) is distinguished by the general cinereous colour of its plumage, by having a narrow white mark round the neck, the bill being straight, and the tail feathers of the male curved upward.

The male is called mallard, or drake, and the female has the name of duck.

Wild ducks are very common in most of the fenny parts of England: they are also found on the continent of Europe, in Asia, and America.

One mode of catching wild ducks, in the fens of Lincolnshire and some other count ries, is by what are called *decoys*. These are ponds, generally formed in marshy situations, and surrounded with wood or reeds, and if possible with both. The wild birds are attracted into nets placed in the ditches of the decoy, by ducks trained for the purpose, and called decoy-birds. The latter fly abroad, but regularly return, for food, to the

pond of the decoy, where they mix with tame ducks, which never quit the place. When it is required to catch the wild birds a quantity of hemp-seed is thrown into the ditches. The decoy and tame ducks lead them in search of this, along the ditches, which generally have reed-skreens at certain intervals on each side, to prevent the decoy-man from being seen. And as soon as they have advanced to the part of the ditch over which the net is extended, the man appears behind. Fearful of returning past him, and unable to escape by flight, they proceed onward to the end of the net, which terminates on the land, and are there caught by a man stationed for the purpose. The trained birds return back, past the decoy-man, into the pond again. The general season for catching wild ducks is from the latter end of October until the beginning of February; and we are informed that, in ten decoys which are near Wainfleet, as many as 31,200 wild ducks, wigeon, teal, and other water fowl, were caught in a single season.

These birds are the original to which we are indebted for our valuable breed, the common or *tame duck*.

185. *The TEAL and WIGEON (Anas crecca and penelope) are two small species of duck, of which the former has a green spot on each wing, and a white line about and beneath the eyes; and the latter has the tail somewhat pointed, the under part near the tail black, the head brown, the front white, and the back waved with ash-coloured and blackish marks.*

Both these species are common in England, and are killed for the table.

186. *The EIDER DUCK (Anas mollissima, Fig. 48) is about twice the size of the common duck, and known by its bill being cylindric, and the cere or naked skin at the base being divided into two parts at the back, and wrinkled.*

These birds inhabit the northern parts of Europe, Asia, and America, and generally form their nests on small islands not far from the sea-shore.

The nests of eider ducks are constructed, externally, of marine plants, and lined with white down, which the birds pluck from their own breasts. This is the substance called *eider down*. It is collected, from the nests, by the bird-catchers, who, for that purpose, carefully remove the females, and then take away a certain portion both of down and eggs from each. More down is plucked from their breasts, and more eggs are laid to supply the place of those that have been taken. The nests are plundered in the same manner as before; and when the young ones are fledged, the whole of the down that remains is collected. It is generally reckoned that the down of one nest, after it has been picked and cleansed, will weigh about a quarter of a pound; and the bulk of the whole quantity may easily be imagined, when it is stated that three quarters of an ounce of eider down is more than sufficient to fill the crown of a large hat. The use of this down is for making beds, but, particularly, for making what are called down quilts, a kind of covering almost like a feather bed, which is used in the northern countries of Europe, as a protection against cold, instead of a common quilt or blanket.

The *flesh* and the *eggs* of these birds are used for food, and their *skins* are sewed together and made into under garments by the inhabitants of Greenland.

187. The PUFFIN (*Alca arctica*, Fig. 49) is a marine bird about the size of a pigeon, and distinguished by having a large bill compressed at the sides and marked with four grooves; the top of the head, a ring round the throat, and all the upper parts of the plumage, black, and the under parts white.

These are birds of passage, arriving in this country about the beginning of April, and leaving it in August. They are chiefly found on rocks and elevated ground, in unfrequented places, near the sea-shore.

The breeding of puffins is encouraged in the island of Prestholme, North Wales, and other parts of the British dominions, as a source of profit. The birds, which, in some places, are numerous beyond all calcu-

lation, form their nests in holes in the ground, each nest containing only a single white egg. The young ones are seized before they are quite fledged; and, after the bones are taken out, the skin is closed round the flesh, and they are pickled in vinegar impregnated with spices. In this state they are sold as a delicacy for the table. The flesh of the old birds is rank and unpalatable, in consequence of their feeding on seaweeds and fish. We are informed, by Dr. Caius, that, in Roman Catholic countries, puffins are permitted to be eaten instead of fish during Lent, and on other fast days.

188. *PENGUINS* (Fig 50.) are a tribe of marine birds with straight and narrow bills, furrowed at the sides; the legs situated so far back that they walk in an upright position; and the wings small, not calculated for flight, and covered with a broad and strong membrane.

Most of the penguins are found in different islands of the South Seas.

Vast numbers of these birds inhabit the Falkland islands, and, to mariners, they have sometimes afforded a very seasonable supply of food. They are in general extremely fat, and must be skinned before they are eaten. Sometimes they have been salted and packed in casks to supply the place of beef. These birds are so fearless of the approach of mankind, that there is no difficulty in knocking them down and killing them with sticks.

Penguins form their nests in holes in the ground, and generally lay one egg in each nest. The eggs are an excellent food.

189. *PELECANIS*, or *CORVORANTS*, are a tribe of birds distinguished by their bills being hooked at the end, and furnished with a nail at the point and a pouch beneath, and having their face naked.

There are more than thirty known species of pelecans, some of which are found in nearly every part of the world.

Of these the most remarkable species is the great, or

WHITE PELECAN (*Pelecanus onocrotalus*). It is furnished with a bag attached to the lower mandible of its bill, so large as to be capable of containing a great number of fish. On these the pelean feeds, and, by means of this bag, is enabled to convey them as food for its offspring. We are informed that the inhabitants of Mexico sometimes obtain a supply of fish by cruelly breaking the wing of a live pelean, and then tying the bird to a tree. Its screams are said to attract other pelecans to the place, which give up a portion of the provisions they have collected to their imprisoned companion. As soon as this is observed the men, who are concealed at a little distance, rush to the spot, and take away all except a small portion, sufficient for the support of the prisoner.

The Chinese train one of the species (*Pelecanus sinensis*) to catch fish, and the birds are so well trained that they do not appear to swallow any, but such as are given to them for encouragement and food.

190. The GANNET (*Pelecanus bassanus*, Fig. 51) is a species of pelean so numerous, and, at the same time, so important to the inhabitants of some parts of Scotland, that, in the island of St. Kilda only, more than 20,000 are said to be annually killed by the inhabitants as food. The young birds, however, alone are eatable; and, to obtain these and the eggs, the bird-eatchers undergo the greatest risks. They not only climb the rocks, but even allow themselves to be lowered from the top of the most dangerous precipices, by ropes, to the ledges on which the nests are placed. As gannets and their eggs are a principal support of the inhabitants of St. Kilda throughout the year, they are preserved, for this purpose, in a frozen state, in small pyramidal stone buildings covered with turf and ashes.

CLASS III.—AMPHIBIA.

ORDER I.—REPTILES.

191. The GREEK TORTOISE (*Testudo græca*) is a species of reptile of dirty yellow and black colour ; with four feet, and a somewhat hemispherical shell, consisting of thirteen middle convex pieces, and about twenty-five marginal ones.

These animals are about eight inches long, and three or four pounds in weight. They are found in woods of many of the countries of the Continent, and in most of the islands of the Mediterranean.

In nearly all countries where these tortoises abound they are considered valuable as food ; and are cooked in various ways, but are chiefly used for soup. By some people the *blood* is eaten without any culinary preparation.

Each tortoise towards the end of June lays, in the sand, from thirty to forty eggs, of round shape, and about the size of those of a pigeon. These eggs, when boiled, are in particular esteem for the table. In some parts of Italy it is customary to collect and bury them in places dug in the earth ; and when the young ones appear, they are fed and taken care of until they are in a fit state to be killed for the table.

In their habits the animals are mild and peaceable ; and, being furnished with a house which they continually carry about with them, and into which they can, in an instant, withdraw their head, legs, and tail, they have no danger to fear from their enemies. So great is the strength of their shell that instances have occurred of their having been run over, even by waggons, without injury. Tortoises have been known to live to the age of more than 100 years.

192. Several other kinds of tortoises serve for food as

well as the present; particularly the *ROUND TORTOISE* (*Testudo orbicularis*), which is in great request for the tables of the opulent inhabitants of Germany and Hungary.

193. The *HAWK'S-BILL TURTLE* (*Testudo imbricata*, Fig. 53) is a marine species of tortoise, of yellowish and brown colour, which has fin-shaped feet each with two claws, thirteen plates in the middle of the shell, and twenty-one round the margin, lying somewhat loosely over each other at the edges.

This animal, which is from two to three feet in length, is a native of the American and Asiatic seas; and is also sometimes found in the Mediterranean.

The plates or scales of the hawk's-bill turtle constitute that beautifully variegated and semi-transparent substance called *tortoise-shell*. This, after having been softened by means of boiling water, is capable of being moulded into almost any form; and is in request by opticians and other artists for many purposes both useful and ornamental. The ancient Greeks and Romans were so partial to the use of tortoise-shell that they decorated with it their doors, the pillars of their houses, and even their beds; and the great consumption of it at Rome may be imagined by the relation of Velleius Paterculus, who informs us that, when the city of Alexandria was taken by Julius Cæsar, the magazines or warehouses were so full of this article that he proposed to have it made the principal ornament of his triumph.

The best tortoise-shell which is brought into this country pays an import duty of 1s. 4½d. per pound; and the quantity vended at the East India Company's sales in 1808 was no less than 13,728 pounds.

The *flesh* of the hawk's-bill turtle is not only of bad flavour, but is said to be even in some degree poisonous; persons who have partaken of it having been seized with vomiting and other unpleasant symptoms. The *eggs*, however, are esteemed peculiarly delicious.

194. The COMMON, or GREEN TURTLE (*Testudo mydas*, Fig. 52), is a marine species of tortoise, distinguished by its oval shape; by the fore-feet only having two claws, the scales neither folding upon each other, nor having any ridge, and the middle scales being thirteen in number.

These, which are the largest kind of tortoise that is known, are sometimes six feet and upwards in length, and five or six hundred pounds in weight.

They are found, and generally in great numbers, on the unfrequented sea-shores of most countries within the torrid zone.

This species of turtle is one of the most valuable gifts of Providence, to the inhabitants of tropical climates, and to mariners frequenting those climates. It affords them an abundant supply of agreeable and nutritive food. So numerous are they, in some places, that instances have occurred of forty or fifty having been obtained in the course of three hours. They are generally caught whilst asleep on the shore. The seamen go gently to the places where they are found, and successively turn them on their backs. From this position they are unable to recover their feet, and thus are perfectly secured until a sufficient number can be collected for conveyance on ship-board. Turtles are sometimes killed with spears whilst lying at the bottom of the sea in shallow water, or whilst swimming on the surface.

The females dig hollow places in the sand of the sea-shore, a little above high water mark; and in these they deposit sometimes more than a hundred eggs, carefully concealing them, from observation, by scratching over them a thin layer of sand. These eggs, which are wholesome food, are nearly globular, each two or three inches in diameter, and covered with a strong membrane, somewhat like wet parchment. They consist of a yolk, which by boiling hardens like that of other eggs, and of a white that is incapable of being hardened by heat.

The parts of the turtle most in esteem are those

about the belly, which are of delicate white colour, somewhat resembling veal; and the green fat, which possesses a very peculiar odour. The whole is extremely nutritious, and of a soft gelatinous nature; but, as it contains a large proportion of strong fat, it should not be eaten without salt and pepper, or other spice; and should be carefully avoided in every form by invalids and persons whose digestive powers are impaired. The flesh of the turtle is sometimes cut into pieces and salted, and in this state forms an article of traffic in the West Indies. Not only the flesh, but even the intestines and eggs are salted. The *fat* yields a greenish yellow oil, which is used in lamps for burning, and when fresh with food. The inhabitants of some countries convert the upper *shells* of turtles into canoes, troughs, bucklers, and other useful articles; and sometimes adopt them as a covering for houses.

It does not appear that the turtle has been introduced into England, as an article of luxury for the table, more than seventy or eighty years. We import these animals chiefly from the West Indies.

195. The *EDIBLE FROG* (*Rana esculenta*) is distinguished by its back being angular, and by having three yellowish stripes which extend from the muzzle almost to the hind legs.

These animals are not only common in England, but are found in ponds, ditches, and fens, in nearly all the temperate parts of Europe.

As an article of luxury for the table the Edible frogs are in great request in France, Germany, and other countries of the Continent. They are generally caught, in the autumn, by rakes with long close-set teeth, by nets, and in numerous other ways. Some persons amuse themselves by catching them with lines and hooks baited with insects or worms. At this season they are collected in thousands, and sold to the wholesale dealers, who have large conservatories for them: These are holes dug in the ground, to the depth of four or five feet, covered at the mouth with a board, and

over this, in winter, with straw. We are informed, by Dr. Townson that at Vienna, in the year 1793, there were only three great dealers in frogs; by whom most of those persons were supplied who carried them to the markets for sale.

The parts that are eaten are chiefly the hind quarters.

196. In America the species called *BULL-FROGS*, which sometimes measure eighteen inches and upwards in length, from the nose to the hind feet, are not unfrequently adopted as food.

197. The *CROCODILE* and *ALLIGATOR* (*Lacerta crocodilus* and *alligator*) are two immense animals of the lizard tribe, the principal distinction between which is founded on the head and part of the neck of the former being more smooth than those of the latter; and in the snout being proportionally more wide and flat, as well as more rounded at the extremity.

The length of the crocodile, when full grown, is from eighteen to about twenty-five feet; and that of the alligator somewhat less. Crocodiles are chiefly found in the river Nile; and alligators in rivers and lakes of some parts of America.

The *flesh* of both these animals has a strong, unpleasant, and somewhat musky flavour; yet it is eaten by the natives of most of the countries in which they are found. It is white and juicy; and the parts that are preferred are those about the belly and tail. The flesh of the young ones is, however, said to be devoid of any unpleasant taste, and to be sufficiently palatable even to Europeans. The *eggs* also are eaten. Of the *teeth* of the alligator, which are as white as ivory, the Americans make snuff-boxes, charges for guns, and several kinds of toys.

There is an unfounded opinion that the upper jaws of these animals are moveable; and that they have no tongue. They swim with great velocity, and sometimes float asleep on the rivers, like immense logs of wood. Their voracity is excessive; springing in a very surprising manner upon animals on which they prey, they

instantly drag them into the water, sink to the bottom, and there devour them. The females deposit their eggs, from eighty to a hundred in number, in the sand, and leave them to be hatched by the heat of the sun.

198. The *GUANA* (*Lacerta iguana*, Fig. 55) is a species of lizard, four or five feet in length, which has a round and long tail; the back with an elevated ridge of scales; and the throat with a pouch that is capable of being inflated to a large size.

These animals are found among rocks, or in woods, in several parts of India and America. In Surinam, Guiana, and Cayenne, they are very numerous: and they are occasionally caught in the West Indian islands.

Scarcely any species of animal food is so much admired by epicures in hot climates as the flesh of the guana. It is preferred even to that of the turtle, and is cooked in various ways, being roasted, boiled, or converted into soup. The fat of these animals, after having been melted and clarified, is applicable to many uses. The flesh is sometimes salted, and exported for sale to distant countries.

There are several modes of catching guanas. In many parts of America they are chased by dogs, which are trained purposely to this pursuit. Frequently they are caught with snares placed near their haunts, and sometimes by a noose of cord affixed to the end of a long rod.

The eggs of the guana, which are generally found in the sand near the sea-shore, are said to be preferable for sauces and other purposes of cookery to the eggs of poultry; but, when eaten alone, they are viscid in the mouth, and to an European palate have at first a very disagreeable taste.

199. *SERPENTS*.—Several kinds of serpents are adopted as food by the inhabitants of countries in which they are found. The American Indians often regale themselves on *RATTLE-SNAKES* (*Crotalus horridus*), skinning and eating them as we do eels. The

GREAT BOA (*Boa constrictor*), which sometimes measures more than thirty feet in length, is a favourite food with the negroes of some countries. The flesh of the **COMMON VIPER** (*Coluber berus*) has been strongly recommended as a medicine in several complaints, such as leprosy, scurvy, rheumatism, and consumptions, but its virtues have been much exaggerated.

CLASS IV.—FISHES.

ORDER I.—APODAL FISH.

200. The **ROMAN EEL** (*Muraena helena*, Fig. 56) is a long and slimy fish, of serpentine form, variously marked and spotted, and destitute of pectoral fins.

It is an inhabitant both of fresh and salt waters, and is chiefly found in the Mediterranean sea, and the rivers that run into that sea.

By the Romans this fish was regarded one of the greatest delicacies which could be introduced at their tables; and instances have been recorded of wealthy persons having even fed them with the flesh of slaves that had been condemned to die, believing that they were thereby rendered still more delicious.

On many parts of the coast of Italy reservoirs were made in the sea for storing and fattening these fish in; and the luxurious Sybarites exempted from every kind of tribute the persons who sold them. Representations of them were made into ear-rings, and into other ornaments for female attire. Pliny tells us, that one of the Roman punishments for youths under the age of seventeen years was to flog them with whips made of eel-skin.

201. The **COMMON EEL** (*Muraena anguilla*, Fig. 55) is distinguishable by its lower jaw being somewhat longer than the upper, and the body being of an uniform colour.

It is an inhabitant of rivers and ponds in almost every country of Europe; and sometimes grows to the weight of fifteen or twenty pounds.

The *flesh* of the eel affords a very rich and delicious food; and, were it not for groundless prejudices, arising from its serpent-like shape, this fish would be in much greater request for the table than it now is.

So abundant are eels, in many of the rivers adjacent to the sea, that, in the first autumnal floods several tons' weight have sometimes been caught in a day; and, in the river Ban, near Coleraine, in Ireland, there is an eel-fishery of such extent as to be let for 1000*l.* per annum. The modes of taking eels are various; but these are chiefly by traps or engines of different kinds, so contrived as to admit of their entering, but to prevent their return.

In the river Nyne, Northamptonshire, a small kind of eels are caught, with small head and narrow mouths, which have the name *bed-eels*. What are called, in the south of England, *grigs*, *gluts*, or *snigs*, are a variety of the common eel with larger head, blunter nose, and thicker skin. *Silver eels* owe probably their distinction of colour to the clear and gravelly streams in which they feed.

Eels are considered in highest perfection for the table from the commencement of spring till about the end of July; yet they continue good till the end of September. The modes of cooking them are numerous and well known. In some parts of the Continent the *skins* are made into a kind of ropes, which have great strength and durability. The inhabitants of several of the districts of Tartary use them, in place of glass, for windows; and, in the Orkney Islands, they are worn as a remedy for the cramp. Bits of eel-skin are not unfrequently put into coffee to clarify it. In many parts of the North of Europe the *scales*, which are extremely minute, are mixed with cement to give a silvery lustre to the houses.

202. The CONGER, or SEA EEL (*Muraena conger*), is chiefly distinguished from the common eel by the lower jaw being shorter than the upper, and the lateral or side line being white.

It is found in all the European seas; and, when at its full growth, measures from six to twelve feet in length, and from twelve to twenty inches in circumference.

So numerous are congers on some of the British shores, that, from Mount's Bay, in Cornwall, there have, in some years, been more than ten tons' weight of dried congers exported to different parts of Spain and Portugal. These fish are also peculiarly abundant in the neighbourhood of the Orkneys and Hebrides. They are chiefly caught with strong lines, each about 500 feet in length, and having sixty hooks placed about eight feet asunder. The lines are sunk in the sea, and sometimes so many of them are fastened together that they extend nearly a mile in length.

The *flesh* of the conger is white, but coarse and greasy; and, though frequently eaten, is to some persons extremely disgusting. In the salting and drying of these fish they shrink to less than one-fourth part of their original weight, and the process is attended by the most nauseous stench. By the Spaniards and Portuguese dried congers are ground or beaten into powder, to thicken and give a relish to soups.

203. SAND-LAUNCE, SAND EEL, or WRECKLE (*Ammodytes tobianus*), is a small fish, distinguished by its eel-shape, its head being narrower than the body, the lower jaw much longer than the upper, and the upper lip being doubled.

There is only one ascertained species of launce: this is found on sandy sea-shores in the Northern Ocean, and seldom exceeds the length of six or eight inches.

From about the end of June to the middle of October these brilliant little fish are caught in great numbers on the southern coasts of England. They are sometimes fished for with seine nets, which have small meshes, and sometimes are dug out of the sand, at low water, with a kind of fork that has three or four short and flat prongs.

When eaten perfectly fresh, these are among the richest and most delicious fish that are known. But, to have them in perfection, they should be cooked almost immediately after they are caught. They so soon become putrid that it would be impossible to convey them to any distant market. The inhabitants of some parts of the Continent salt and dry them, and, in this state, they are considered a great delicacy.

204. *The EUROPEAN SWORD-FISH* (*Xiphias gladius*, Fig. 57) is known by having its upper jaw lengthened into a hard and sword-shaped blade; and its dorsal fin long, and lowest in the middle.

These fish are of steel-blue colour, and measure from fifteen to twenty feet in length.

They are found in most parts of the European seas.

By the ancient Romans sword-fish were highly esteemed as food; and were killed, with harpoons, by persons stationed in boats for that purpose. They were not only eaten fresh, but were also cut into pieces and salted. The inhabitants of Sicily are, at this day, extremely partial to them, and purchase them, particularly the smaller ones, at very high prices. The parts chiefly in request are those about the belly and tail. In several places, near the Mediterranean, the fins are salted and sold under the name of *callo*.

ORDER II.—JUGULAR FISH.

205. *The COMMON COD* (*Gadus morhua*, Fig. 58) is distinguished by having three fins upon its back, a small fleshy beard on the under jaw, the tail fin nearly even at the extremity, and the first ray of the anal fin spinous.

The average weight of these fish is from ten to twenty, or thirty pounds.

To the inhabitants of many countries, but more especially to those of our own, the cod fishery is a very essential source of wealth. It affords occupation to many thousand persons, and employment for several hundred sail of shipping. The fishery on the great

bank, near the island of Newfoundland, is by far the most important of any that has hitherto been discovered in the world, and the resort of fish to this spot is beyond all imagination numerous. In the year 1791 there were caught more than 750,000,000 pounds weight.

This immense bank is a vast mountain in the sea, more than 400 miles long, 150 miles broad, and, in depth of water, from twenty to sixty fathoms. It was first discovered in the reign of Henry the Seventh; and in 1548 an act of parliament was passed, by which all Englishmen were permitted to traffic and fish on the coasts of Newfoundland and the adjacent banks, without payment of any duty. In 1583 Sir Humphrey Gilbert took possession of the island of Newfoundland in the name of Queen Elizabeth; and the first English company that associated to settle a colony there was incorporated by a patent of King James the First, in 1609.

The Newfoundland fishery at present gives freight to about 300 vessels, from 100 to 200 tons' burden each. These are chiefly fitted out from the islands of Guernsey and Jersey, from Ireland, and some ports of the English Channel, as Pool, Dartmouth, &c. When these vessels arrive at the fishery, a kind of gallery is formed, which reaches from the main-mast to the poop, and sometimes even from one end of the ship to the other. This is furnished with tuns stove in at one end, into which the fishermen get, to be sheltered from the weather, their heads being covered with a kind of roof fixed to the top of the tun. The mode of fishing is by hook and line only; and the baits are herrings, a small fish called capelins (209), shell fish, or pieces of sea fowl. Each man can catch only one fish at a time; yet an expert fisherman has sometimes been known to take 400 in a day. As soon as the fish are caught the tongues are cut out, the heads cut off, and the liver, entrails, and spine, are all taken out. After this they are salted and piled, for some time, in the holds of the

vessels, and then packed in barrels for sale, under the name of *green* or *wet cod*. When the fish are to be dried, they are conveyed in boats to the shore, where they are headed, cleansed, and salted, upon stages or scaffolds erected for that purpose. They are subsequently spread on the shore to dry; these are called *dry cod*, and constitute the principal object of the Newfoundland trade. The chief markets to which the fish are conveyed are those of Spain, Portugal, Italy, and the Levant.

The most important fishing banks of Europe are in the neighbourhood of Iceland, Norway, and the Orkney Islands; and the Dogger-bank, and Well-bank, betwixt this country and Holland.

As the air-bladders of cod are thick and of a gelatinous nature, the Icelanders frequently make *isinglass* of them, similar to that which we usually import from Russia. By the Newfoundland fishermen the air-bladders are generally salted and packed in barrels under the name of *sounds*; and these, when good, are considered a great delicacy for the table. The *tongues* are prepared in the same manner and for the same purpose. From the *livers*, after they have become in a certain degree putrid, a kind of oil is obtained which is considered superior to whale oil (89), because it preserves leather longer flexible, and, when clarified, yields less vapour in burning than that. The *roes* are collected by the Icelanders, salted, packed in barrels, and sold to the Dutch, French, and Spaniards, as bait for anchovies and other fish. Before the commencement of the French revolution from 20,000 to 30,000 barrels of these roes were annually exported from Bergen. The inhabitants of some parts of Norway, when forage is scarce, dry the *heads* of cod, and, mixing them with some species of sea-weeds, give them as food to their cattle.

The London markets are abundantly supplied with fresh cod from the fishing banks adjacent to our own country. These fish are in season from the beginning of

December till about the end of April; and are brought alive to the Thames in well-boats, the air-bladders being previously perforated with a pointed instrument, to prevent the fish from rising in the water. Cod should be chosen for the table of middling size, plump about the shoulder and near the tail, the hollow behind the head deep, and with a regular undulated appearance on the sides, as if they were ribbed. The gills should be very red, the eyes fresh, and the flesh white and firm.

It is generally considered that the shoals of cod confine themselves between the latitudes 66° and 50° north. Those which are caught to the north or south of these degrees are both few in quantity and bad in quality.

206. *The HADDOCK (Gadus aglefinus) is a fish of the cod tribe, which has three fins upon its back, a small fleshy beard on the under jaw, the upper jaw the longer, and the tail somewhat forked. There is a dark oval spot on each side of the body a little below the gills.*

These fish seldom exceed the weight of seven or eight pounds.

Our markets are principally supplied with haddocks from the coast of Yorkshire and other eastern parts of England. They are best in season betwixt the months of July and January, after which they deposit their eggs or roe, and, for many weeks, are scarcely eatable; but those which have not begun to breed may be admitted to the table after this period. Their flesh, which in a degree resembles that of the common cod, is white, firm, well-tasted, and easy of digestion. Those that are best for the table do not usually exceed the weight of two or three pounds.

Though haddocks are sometimes caught with nets, they are much more frequently taken by lines. Each of these has a great number of hooks, and is placed in the sea at the ebb of the tide, and taken up at the ensuing tide. The numbers thus caught have, in some instances, been almost beyond belief. Some idea may

however be formed respecting them, when it is stated that shoals of haddocks have not unfrequently been known to extend four or five miles in length and nearly a mile in width.

These fish are sometimes salted and packed in barrels like cod. And, if this be skilfully done, they are excellent eating, and may be kept good for a great length of time.

207. *The TORSK* (*Gadus callarias*, Fig. 59) is a species of cod which has three fins upon its back, a small fleshy beard on the under jaw, the upper jaw longer than the lower, and the tail fin nearly even at the extremity.

Its usual weight is from two to seven or eight pounds.

As an article of food the torsk is said to be superior to every fish of its tribe. It is principally found in the Baltic Sea and the Northern Ocean, and has not hitherto been known to frequent the English shores. The most favourable seasons for catching these fish, in Greenland, are the spring and autumn; and the general mode is by lines made of pieces of whalebone, or thongs of seal-skin, the hooks being baited with fish.

The Icelanders frequently salt and dry them, as one of their articles of subsistence for the winter.

208. *The WHITING POUT* (*Gadus barbatus*) is a small fish of the cod kind, distinguishable by the great depth of its body, which is usually about one-third of its length; by having three dorsal fins, a small fleshy beard on the chin, and seven punctures on each side of the lower jaw.

Its weight seldom exceeds a pound and half or two pounds.

These delicate fish are found in shoals, near several of the shores of Europe. They are usually caught about the month of August; and are so plentiful on some parts of the French coast that fishermen have been known to take two or three hundred of them at a single haul of their nets.

The French consider them to be dry and insipid eating; but in England they are often more esteemed than whittings. The inhabitants of Greenland fre-

quently salt them: they also salt and dry the roes; and are particularly partial to the livers, which they dress and serve to table with crowberries (*Empetrum nigrum*).

209. The *CAPELAN*, or *POOR* (*Gadus minutus*), is a fish of the cod tribe, which seldom exceeds the length of six or seven inches, and differs from all others of the same tribe by being black in the interior of the abdomen.

It has three dorsal fins, a small beard on the chin, and nine punctures on each side of the lower jaw.

In the Newfoundland fishery these fish are of considerable importance, as supplying bait for the taking of cod. They are also found in considerable numbers in the Mediterranean, the Baltic, and the North Sea; and wherever they appear they are a source of great joy to the fishermen, since they are believed to announce an abundant supply of valuable fish, which pursue and prey upon them.

It is stated that, in the year 1545, the French coasts in the Mediterranean were visited, for two months, by such myriads of capelans, that many of the inhabitants were obliged to collect together and bury those that were thrown ashore, to prevent any evil consequence that might occur from the corruption of so great a mass of animal matter. These fish are sometimes caught on the coast of Cornwall.

They are considered very delicate food; and when salted are peculiarly excellent. A few barrels of salted capelans are occasionally sent from Newfoundland, as presents to the friends of the merchants in England, but the fish are too small to be salted there as an article of profit. They are caught both with lines and nets.

210. The *WHITING* (*Gadus merlangus*) is distinguished from other fish of the cod tribe by having three fins on its back, no beard on the chin, its upper jaw longer than the lower, the tail-fin somewhat hollowed, the back dusky, and the rest of the body silvery white.

Its weight seldom exceeds two pounds.

The chief season for whiting is during the first three months of the year, though they are frequently brought to market till after Midsummer. They are sometimes caught with nets, but the hook and line are generally preferred, on account of the depth of the water at which they are usually found. The baits are lugworms, and muscles, whelks, or other shell-fish. The shoals of whiting, which approach within two or three miles of our shores, are sometimes extremely numerous. The Dutch fishermen use lines, for catching them, of immense length, and each containing about 250 hooks. These are laid near the bottom of the water; and when taken up have, in many instances, a fish at each hook.

It has been remarked that the flesh of the whiting, which is usually considered very delicate eating, varies much with the season and the kind of shore where the fish are caught. Those which frequent sandy flats, at a little distance from the shores, are smaller and much better flavoured than others that are taken on banks distant from the sea-coasts. They should be chosen for the table by the redness of their gills, the brightness of the eyes, and the general firmness of the body and fins.

In the neighbourhood of Bruges and Ostend whittings are frequently salted; and conveyed for sale into the interior of France and Germany, where, in general, they are considered preferable to salted cod.

211. *COAL-FISH, or PILTOCKS* (*Gadus carbonarius*), are a kind of cod with three dorsal fins, no beard on the under jaw; the under jaw longer than the upper, the side line straight, and the mouth black within.

They are frequently two or three feet long, and twenty pounds and upwards in weight.

These fish are indebted, for their name, to the dark colour which their body generally assumes when they have attained their full growth. To the inhabitants of the Orkney Islands, and of the extreme northern parts of Scotland, they afford a most important supply of

food, at a season of the year when the poor are deprived of almost every other means of subsistence. At the approach of winter, when the seas are stormy, myriads of these fish run into the bays; and they continue in the immediate neighbourhood of the same coasts till the months of February and March. They are nearly as important an object of pursuit on account of their *livers* as for their *flesh*. From these is obtained a considerable quantity of oil, which is used for burning in lamps, and for numerous other purposes. The young Coal-fish approach the Yorkshire coasts in the months of July and August, and, when four or five inches in length, they are much esteemed as food; but the older fish are so coarse and bad, that, where other food is to be obtained, few people will eat them. By being salted and dried, however, they are rendered firm and palatable.

Coal-fish are usually caught with lines. The best bait for them is a sprat or a limpet parboiled. The Shetlanders use the latter; and, seated on the rocks projecting over the water, or in boats, they are very expert in catching them. A man, holding a rod in each hand, will frequently draw them up as fast as he can put down his lines. He keeps a few limpets in his mouth, and baits his hook at a single motion with one hand, assisted by his lips, and with the greatest ease and certainty. The fish thus caught are generally those of the second year's growth, and are not much larger than herrings.

212. POLLACK (*Gadus pollachius*) is a fish belonging to the cod tribe, with three dorsal fins, no beard to the under jaw, the under jaw longer than the upper, the tail-fin forked, and the side line much curved.

The usual weight of the pollack is six or seven pounds, but it sometimes much exceeds this.

In the Baltic Sea and the Northern Ocean, particularly in those parts where the bottom is rocky, and the sea much agitated, these fish appear, at stated seasons, in great shoals, playing about on the surface in all directions and in the most sportive and agile manner. Near

Lubec and Heligoland they are sometimes caught, in immense numbers, in nets, or with lines and hooks baited with a feather, a small fish, or a bit of the skin of an eel. They frequent some of the southern parts of our coasts in the summer, and the eastern shores of Yorkshire in winter.

As an article of food, pollacks are usually considered inferior to whiting, but, in some places, they are much esteemed. On the Continent they are sometimes salted, and eaten during Lent by the inferior classes of people.

213. *LING* (*Gadus molva*) are a species of cod which have two dorsal fins, a small beard on the under jaw, the under jaw longer than the upper, and the tail fin rounded.

They are caught in great numbers in the Northern Ocean, and about the northern coasts of Great Britain and Ireland; and when full grown are three or four feet in length.

The importance of these fish in a commercial view, is very great. Their size, the numbers in which they are caught, the excellence of their flesh when salted, and the value of the oil that they yield, all contribute to render them an object of eager pursuit by fishermen in those countries on the coasts of which they are found. More than 900,000 pounds' weight of ling are annually exported from the coasts of Norway. In England they are fished for and cured in the same manner as eod (205): and it is said that they bear carriage to great distances much better than cod.

Ling are in season from February until about the end of May. Vast numbers of these fish are salted in the northern parts of England, for exportation as well as for home consumption. When they are in season the liver is white, and yields a great quantity of fine and well-flavoured oil. This is extracted by placing it over a slow fire; but if a sudden heat be applied, very little oil can be obtained. As soon as the fish are out of season the liver becomes red, and affords no oil. A kind of isinglass is made from the *air-bladders*. The *tongues* are eaten either fresh, dried, or salted.

214. The BURBOT (*Gadus lota*, Fig. 60) is a somewhat eel-shaped species of cod with two dorsal fins, a single fleshy beard on the under jaw, the jaws nearly equal in length, and the tail rounded.

This fish is found in some rivers of England, and in rivers and lakes of the Continent; and when full grown weighs two or three pounds.

Although the burbot is esteemed a very delicate fish for the table, it is so common in the Oder, and in some other rivers of Germany, that the fishermen, unable otherwise to dispose of all they catch, not unfrequently cut the fattest parts of the fish into slips, and, after drying them, burn them instead of candles. The livers are large and of peculiarly excellent flavour. It is related of a Countess de Beuchlingen, in Thuringia, that she was so partial to the livers of burbots as to expend a great portion of her income in the purchase of them. If suspended in a glass and placed near a hot stove, or in the heat of the sun, they yield an oil which was formerly in great repute as an external application for the removal of swellings. The air-bladders, which are so large as often to be nearly one-third of the whole length of the fish, are employed in some countries for making isinglass.

ORDER III.—THORACIC FISH.

215. The JOHN DOREE (*Zeus faber*, Fig. 65) is a fish very much compressed at the sides, with large head, wide mouth, long filaments to the rays of the first dorsal fin, the tail rounded, and a roundish black spot on each side of the body.

This fish is an inhabitant of most seas, and is usually about a foot and a half in length; but it is sometimes known to weigh so much as ten or twelve pounds.

It has only been within about the last half century that this delicious, though hideous-looking, fish, has had a place at our tables; and the first person who brought it into notice was the well-known actor and bon-vivant, the late Mr. Quin.

Near the coasts of Devonshire and Cornwall, dorées are caught in great number both in nets and with lines; and they are principally in season during the months of October, November, and December. Their name is a corruption from the French *jaune dorée*, and signifies golden yellow fish, this being their colour when first taken out of the water.

216. The *HOLIBUT* (*Pleuronectes hippoglossus*) is a flat fish of considerably lengthened shape, of olive or blackish colour above, with smooth body, and the tail hollowed at the extremity. The eyes (as viewed from the head toward the tail) are on the right side.

These, the largest of all the European species of flat fish, inhabit both the European and American seas, and frequently weigh from 100 to 300 or 400 pounds each.

As the holibut is found only at the bottom of the water, the usual mode of catching it is with hooks and lines; and its size is so great that, for sale in the markets, it is customary to cut it into pieces. The season in which it is most esteemed is during the months of October, November, and December.

Though, in general, a coarse food, the parts which are near the side fins are fat and delicious, but too rich for any one to eat much of them. The inhabitants of Greenland eat of these fish both fresh and dried. They also eat the *skin* and the *liver*; and the *membrane of the stomach* serves instead of glass for windows. The Swedes and Teelanders make of holibut a food called *raff* and *ræchel*; the former consisting of the fins with the fat skin to which they are attached; and the latter of pieces of the flesh cut into stripes, salted, and dried on stieks in the air. Holibuts are also salted in the same manner as herrings, which is said to be the best mode of curing them; but, in this state, they are coarse and bad eating.

217. The *PLAISE* (*Pleuronectes platessa*) is a kind of flat fish easily known by a row of six bony protuberances behind the

left eye, and its upper side being marbled with olive and brown, and marked with orange spots.

Though usually of small size, this fish sometimes grows to the weight of twelve or fourteen pounds, and is found on the shores of almost all the countries of Europe.

The best and largest plaise are said to be caught on some parts of the coast of Sussex. They are in greatest perfection from December to March, and in July, August and September. Those that are of tolerably large size are firm and well-flavoured, but the small and thin fish become gluey by boiling. The flesh of the former is bluish, and of the latter reddish white. Plaise are generally caught with nets called seine nets, which are hauled upon the shores.

In some countries these fish are salted and dried as articles of commerce; and in others the best of them are skinned, dried, and pressed into particular forms, and, when eaten, are cut like cheese.

218. *The DAB* (*Pleuronectes limanda*) is a species of flat fish, of yellowish brown colour, with the eyes on the right side of the body, the scales hard and toothed, and the lateral line, at its commencement, curved round the pectoral fin.

It is in general much smaller than the plaise.

Although very common on the shores of the Baltic and Mediterranean seas, the dab is much more scarce on the British shores than the plaise. When in best season, during the months of February, March, and April, it is considered preferable to that fish. In the summer-time its flesh is soft and of bad flavour. The Dutch and Scots fishermen sometimes salt and dry these fish.

219. *The BRILL* is a flat fish somewhat like the turbot (222), but with its eyes on the right side of the body, the whole surface of the body smooth, and a laceration at the beginning of the dorsal fin.

These fish are not uncommon, in somewhat deeper water than the plaise, and the flounder, along the coasts

of Dorsetshire, Hampshire, and some of the eastern parts of England. They are very common at Billingsgate, and in other markets; are considered an excellent fish for the table, being white, firm, and well-flavoured; and are chiefly in season in the months of October and November.

220. *The FLOUNDER* (*Pleuronectes flesus*) is a flat fish which differs from the plaice (217) principally in wanting the six protuberances behind the left eye, in having the lateral line rough, short spines at the base of the upper side of the fins, and a great number of rough points on almost the whole upper surface of the body.

Its weight seldom exceeds two or three pounds.

There are few species of fish so common on the flat and somewhat muddy shores of this country as the flounder. It enters the harbours, and ascends the rivers to a considerable distance from their mouth. It is even caught in places where the water is perfectly fresh, and it is said to be much sweeter and better for the table when taken at a distance from the sea than in salt-water. On this account chiefly it is that the flounders caught in the river Thames have obtained great celebrity. They are in best season from January to March, and from July to September.

Flounders are generally caught with nets in the same way as other flat fish. But sometimes the fishermen catch them by walking gently in the shallow waters, where they abound, and stabbing an iron prong or fork through their bodies, as they lie in the mud. The places where they lie are known by the exposure only of their eyes and mouth, all the other parts of their body being concealed. Small flounders are frequently used by fishermen as bait for crabs and lobsters.

221. *The SOLE* (*Pleuronectes solea*) is a flat fish, the body of which is oblong and rough, and the upper jaw longer than the lower.

It is found off the sandy shores of nearly all parts of the world; and, though in England, it does not often exceed the

weight of three or four pounds, in hot climates it frequently weighs as much as seven or eight pounds.

The sole is a fish in great request for the table, and, except the turbot, is usually considered the most firm and delicate fish of its tribe. Though exposed for sale during nearly the whole year, it is in highest perfection about Midsummer. By the ancient laws of the Cinque Ports no person was allowed to catch soles from the first of November to the fifteenth of March; nor was any one permitted to use nets betwixt sun-setting and sun-rising, that the fish might not be disturbed in their feeding. Soles when good are of thick form, and their under parts are cream-coloured; if the latter are bluish, the fish are flabby and bad. These, unlike most other fish, may be kept several days, even in hot weather, without becoming putrid; and they are always skinned before they are eaten. The *skins* are sometimes dried, and used for the clarifying of coffee.

222. The *TURBOT* (*Pleuronectes maximus*, Fig. 66) is a species of flat fish, distinguished by its eyes being on the left side, the body being broad, marbled with brown and yellow above, and rough with bony protuberances.

The weight of these fish is from four or five to betwixt twenty and thirty pounds.

They are chiefly caught in the European and Mediterranean seas.

It has been calculated that more than 10,000 pounds' weight of turbot are annually consumed in London. These are chiefly caught off the northern coasts of England, and off the coast of Holland. Notwithstanding the high repute of turbot for the tables of the most wealthy and luxurious inhabitants of this country, it has only of late been relished in Scotland, and many persons there still prefer the holibut (216) to it. There are now, or were very lately, living in one of the coast-towns of Scotland several poor people who were accustomed to derive a great part of their subsistence from the turbot which the fishermen threw away upon the beach as of no value. A general officer in the English

army first taught the inhabitants of Fifeshire that these fish were eatable; and astonished the fishermen of that country by offering so great a sum as a shilling a piece for the largest of them.

Many of the vessels, which carry fish to the Thames, are employed in fishing for turbot even so far north as the Frith of Forth, and, in the wells of these vessels, they are brought alive to the London markets. Turbot are caught off the Yorkshire coast with hooks and lines. At Scarborough each fisherman takes, in his boat, three lines coiled upon flat oblong pieces of wicker-work, the hooks being baited and placed in the centre of the coils. The lines are usually furnished with 280 hooks, placed at the distance of six feet two inches from each other. In this fishing there are always three men in each boat, and nine of these lines are fastened together, extending in length nearly three miles, and furnished with 2520 hooks. They are placed in the sea, across the current, and secured by anchors or large stones at the end of every three lines. Their situation is marked by floats or buoys made of leather or cork. The lines are always placed at the turn of the tide; and they are suffered to continue until the next tide, and consequently remain upon the ground about six hours. The best bait for turbot is a fresh herring, though the Dutch fishermen prefer the lesser lampreys (255) to them, and have been known to purchase of the English fishermen, for this purpose, more than 700*l.* worth of these lampreys per annum. Small pieces of haddocks, sand-worms, and some kinds of shell-fish, are also occasionally used; and, when none of these are to be had, bullock's liver is adopted.

Turbots are in season during nearly the whole summer. When in perfection, they are thick, and the under part of the body is of yellowish white colour. If they are thin, or this part has a bluish tinge, they are bad. These fish are generally considered better if kept in a cool place for a few days before they are eaten.

223. The *COMMON PERCH* (*Perca fluviatilis*) is a fresh-water fish, distinguished by having sixteen soft rays to the second dorsal fin, fourteen spiny ones to the first dorsal fin, the upper gill-covers serrated at the edges, and the sides marked by five broad and upright bars of black.

This fish seldom exceeds the weight of four or five pounds.

It is found in rivers and lakes both in Europe and Siberia.

With the ancient Romans the perch was a very favourite fish. Though somewhat bony, it is white, firm, and well flavoured, and is considered an excellent food for persons in a weak state of health. Perch are generally found in rapid streams where the water is somewhat deep. They are caught both with nets and with hooks and lines, and are in greatest perfection from January to March, and again in October and November. In Lapland and Siberia they are sometimes found of enormous size. The Laplanders, in one of their churches, have the dried head of a perch which is nearly a foot in length. The Dutch are particularly fond of perch when made into a dish called *water souchy*.

From the *skins* of perch a kind of isinglass is made which surpasses that made from any other fish. The Laplanders use it to stiffen their bows and make them durable. As this substance might be rendered of use for various purposes of domestic economy, it may not be altogether unimportant to detail the mode of its preparation. The skins are first dried, and afterwards softened in cold water to rid them of the scales. The Laplanders generally take four or five of the skins at a time, put them into a rein-deer's bladder, or wrap them in pieces of the bark of the birch-tree, so that they may not come in contact with the water. They place these in a pot of boiling water, putting on them a stone to keep them at the bottom of the pot; and in this situation they are boiled for an hour. When they have become soft and glutinous, they are taken out, and are then in a state fit for use.

Perch may be bred and fattened in ponds; but care

should be taken not to put them with other fish, as their voracity renders them extremely destructive to any that are weaker than themselves; or they should be accompanied by such only as are intended to furnish them with food. A pond may be stocked with perch by putting only the eggs or spawn into it; and if the situation and circumstances be favourable, the increase in a few years will be extremely great.

These fish are so tenacious of life that instances have occurred of their being packed in wet straw and carried alive to a distance of fifty miles and upwards.

244. *The BASSE is a sea-fish somewhat resembling a perch, with a short and sharp spine on the posterior plate of the gill-cover, fourteen rays to the second dorsal fin, the back dusky tinged with blue, and the belly white.*

This fish sometimes attains the weight of twenty and even thirty pounds.

It is found in the Mediterranean, the British Channel, the Northern Ocean, and the Baltic.

These voracious fish are caught during nearly all the year; but the months of August, September, and October, are considered most favourable for taking them. They not only approach the shores, but even ascend the rivers to great distances. Though their flesh is in general woolly and insipid, the Romans preferred them to many other kinds of fish, and sometimes paid high prices for them. Those which they chiefly esteemed were caught in the Tiber, betwixt the bridges of Rome.

The eggs or *roes* of the basse have sometimes been used in France and Italy to make what is called *Boutargue* or *Botargo*.

225. *The COMMON MACKREL (Scomber scomber) is known from other fish by having five small and distinct fins betwixt the dorsal fin and the tail.*

Its usual length is from a foot to eighteen inches, and its weight seldom exceeds two or three pounds.

The mackrel fishery is an object of great commer-

cial importance to the inhabitants of most of the countries on the shores of which these fish abound. During the summer season they approach our coasts in immense shoals, and are generally caught in what are called seine nets. From June to August many of our markets are supplied with them; but as mackrel become putrid sooner than most other fish, they cannot be carried to any great distance, nor be kept for any great length of time. On this account it is that they are allowed to be sold in the streets of London on Sundays, and in catholic countries on Sundays and festivals.

When quite fresh mackrel are an excellent fish for the table, and are in best season from May to July. Both in Italy and England they are often pickled with vinegar and spices, and sometimes with bay leaves intermixed. By the inhabitants of many parts of the north of Europe they are salted; and, in this state, they constitute a cheap and very important article of subsistence. In Scotland they are frequently cured in the same manner as herrings. It was with these fish chiefly that the ancient Romans formed their celebrated pickle called *garum*. This in the ancient world constituted a very considerable branch of commerce, not only from its being used as an highly esteemed sauce, but also as it was considered a remedy for various diseases. In the Mediterranean the *roes* of mackrel are salted, and used for *caviar*.

226. The THUNNY, or ALBICORE (*Scomber thynnus*, Fig. 61), is a large fish of the mackrel tribe, of steel-blue colour above, and silvery white beneath; and is particularly known by having from eight to eleven distinct fins betwixt the dorsal fin and the tail.

These fish measure from six to ten feet in length, and frequently weigh from 400 to 1200 pounds.

They are chiefly caught in the Mediterranean.

We are acquainted with no species of fish, of size equal to the thunny, which supply mankind with so palatable a food. The thunny fishery is pursued with great ardour, by the inhabitants of nearly all the shores

of the Mediterranean; but, particularly, by those of Spain and Sardinia. It constitutes one of the principal objects of diversion to the inhabitants of Sardinia; and, for the purpose of attending it, many persons of distinction come even from distant countries. The nets, which are of great size and value, are prepared in April, and are consecrated by the priests previously to being thrown into the sea. On the preceding evening the persons employed draw lots for the name of the Saint who is to be considered the patron of the fishing for the ensuing day; and this Saint, whoever he may be, is alone invoked to promote the success of the undertaking.

Notwithstanding their great size, these fish swim in shoals of sometimes more than 1000 together. Pliny, the Roman naturalist, asserts that the fleet of Alexander the Great attempted, in vain, to pass through a shoal of them, in any other manner than closely arranged in order of battle. Of the immense numbers of thunnies some idea may be formed when it is stated that 300,000 or 400,000 of them are supposed every year to pass through the straits of Gibraltar. These fish are not uncommon on the western shores of Scotland, but not in shoals as in the Mediterranean.

The flesh of the thunny differs much, according to the season, and the place where it is taken; hence in Sardinia it is called by different names according with this difference. When raw it is in general red like beef, but, on being boiled, it assumes a pale colour; and when in perfection, its taste somewhat resembles that of salmon. These fish are salted, and sent, in great quantity, to Constantinople and the Greek islands. The thunny was so much esteemed by the ancient Greeks that they consecrated it to Diana.

227. *The BONITO (Scomber pelamis) is a large species of mackerel, of thick form, with seven small distinct fins betwixt the dorsal fin and the tail, and several large scales below the pectoral fin.*

This fish measures eighteen inches or two feet in length, and is ten pounds and upwards in weight.

It is principally found in the seas of tropical climates.

Sometimes these fish approach the European shores; and one of them was caught a few years ago at Christchurch, in Hampshire. To mariners in hot climates they often afford an important supply of food. Their flesh is fat and white, but inferior in excellence to that of the thunny, except when salted. A very lucrative fishery of bonitos is carried on at Cadiz. The fishing commences about the end of April, and continues until the beginning of July; and, in general, affords occupation for about a hundred persons.

228. The RED SURMULLET (*Mullus barbatus*) is a fish known by its large and loose scales, the general red colour of its body, and its having two fleshy beards on the under jaw.

It frequents the European seas, and seldom exceeds the length of eight or ten inches.

229. The STRIPED SURMULLET (*Mullus surmuletus*, Fig. 67.) has large and long scales, is of red colour, with four yellowish stripes along its sides, and two beards on the under jaw.

This fish inhabits both the European and the American seas, and is from ten or twelve inches to two feet in length.

The prices at which the surmullet was sometimes purchased by the Romans were enormously great. We read of a Roman consul having given at the rate of more than 64*l.* of our money for one of them; and of one of the Roman emperors having paid upwards of 240*l.* for another—to such an absurdity of extravagance did this people arrive before the dissolution of their empire. But it went further:—they are said to have considered even the surmullet of little value unless it died in the very hands of their guests. Some of the most-luxurious of the Romans had stews formed even in their eating-rooms, so that the fish could at once be brought from under the table and placed upon it. Here they were put into transparent vases, that the guests might be entertained with their various changes

of colour, from red to violet and blue, as they expired. The parts chiefly admired for the table were the head and the liver.

Both the above species of surmullet occasionally visit our coasts during the summer season. Their flesh is white, firm, and well-tasted; but they cannot long be kept without becoming putrid.

230. *GURNARDS* (Trigla, Fig. 62.) are fish with a large angular and bony head; and two or more distinct appendages near the pectoral fins.

Of about fifteen known species of gurnards, five are caught near the British coasts. These are the GREY GURNARD, RED GURNARD, PIPER, TUB-FISH, and STREAKED GURNARD, of which the two former are considered best for the table. Their flesh is white, firm, and good, though somewhat insipid; and they are thought to be in greatest perfection from about the beginning of May to the end of July.

ORDER. IV.—ABDOMINAL FISH.

231. *The COMMON SALMON* (*Salmo salar*, Fig. 68) is a fish known by its forked tail, the upper jaw being somewhat longer than the lower, and by the extremity of the under jaw, in the male, being hooked and bent upward.

All the fish of the salmon tribe have their hindmost dorsal fin fleshy.

At an early season of the year salmon begin to leave their winter haunts in the ocean, and to pass up the fresh water rivers, sometimes to vast distances, to deposit their spawn. And it is in these peregrinations that they are chiefly caught. The British rivers that are most celebrated for salmon are the Tweed, the Tyne, the Trent, the Severn, and the Thames. Sometimes they are taken in nets, sometimes in traps or engines, and sometimes by harpoons. They have been known to ascend the rivers to the distance of more than 200 miles.

Vast numbers of salmon are annually pickled at Berwick for the London markets, and for sale on the

Continent. These are packed in small tubs, and are usually sold under the name of Newcastle salmon.

The season for catching salmon commences towards the end of the year, but the principal capture is in the month of July; and instances have occurred in which more than 1000 fish have been caught at one haul of a net. Fresh salmon are frequently sent to London from the northern rivers packed in ice. The Severn salmon are earlier in season than those of any other river in England, though not so early as what are caught in some parts of Scotland and Ireland. The Thames salmon are principally taken near Isleworth, and are sold at a most extravagant rate in London. In Ireland the most considerable salmon fishery is at Cranna, on the river Ban, about a mile and a half from Coleraine. At a single haul of one of the nets, about the year 1776, there were taken as many as 1356 fish; this circumstance was so extraordinary as to be recorded in the town books of Coleraine.

In the Severn, Trent, and some other northern rivers of England, no salmon measuring less than eighteen inches from the eye to the middle of the tail is allowed to be caught; nor any whatever betwixt the eighth of September and the eleventh of November (except in the Ribble, where they may be caught betwixt the first of January and fifteenth of September), under the penalty of 5*l.* and forfeiture of the fish. And no salmon of less weight than six pounds are permitted to be sent by fishmongers to their agents in London, under a similar penalty.

When these fish, about the beginning of May, are five or six inches in length, they are called *salmon smelts*, and, when they have attained the weight of from about six to nine pounds, they have the name of *gilse*.

Salmon are a very general and favourite article of food. When eaten fresh, they are tender, flaky, and nutritive; but are thought to be difficult of digestion. The flesh of the salmon is of red colour, and the beauty of its appearance is increased by soaking

slices of it in fresh water before they are cooked. Immediately after the salmon have deposited their spawn they become so flabby and bad as to be unfit for food. Raw salmon is a favourite dish with even the first nobility of Stockholm, insomuch that they seldom give a great dinner in which this food is not presented on the table. It is prepared by merely cutting the fish into slices, putting these into salt, and, when salted, leaving them for three days in a wooden dish, with a little water. In this state it is said to be very delicious eating.

The modes of curing salmon are various, but these are chiefly by *drying*, *smoking*, *salt*ing, and *pickling*. Near the bay of Castries (in the Strait of Saghalier) the Tartars tan the *skins* of large salmon, and convert them into a very supple kind of clothing.

232. In South Wales, and in the rivers of the north of England which fall into the sea, a kind of salmon, called *SEWEN* (*Salmo esiox*), is frequently found. It is known by having nearly an even tail, and being marked with ash-coloured spots. These salmon are chiefly caught from July to September, and seldom weigh more than ten or twelve pounds. They are much inferior to the common salmon in delicacy of flavour.

233. *SALMON TROUT, SEA TROUT, or BUDGE* (*Salmo trutta*), is a species of salmon chiefly characterized by the tail being hollowed, by having seven rays to the anal fin, black spots encircled with ash-colour on the head, back, and sides; and the jaws of equal length.

It inhabits the sea, and rivers adjacent to the sea; and sometimes weighs eight or ten pounds, or more.

The flesh of the salmon trout is red and good, but not so highly flavoured as that of the salmon; and it varies much, according to the quality of the water in which the fish are taken. Salmon trout are caught chiefly with nets; and the fishing for them generally commences about the beginning of May, and continues till after Michaelmas

In some of the northern countries of Europe, where these fish are very numerous, they are cured by *salting*, *pickling*, and *smoking*; and in these different states they are articles of some commercial importance. The smoking of these and other fish is performed in a tub without bottom, which is pierced at the top and round the sides with holes. This tub is raised on three stones; and the fish being suspended within it, they are exposed, for three days, to the smoke of burning oak-branches and juniper berries, which are lighted beneath.

234. *The FRESH-WATER TROUT* (*Salmo trutta*) is a species of salmon which has its tail somewhat hollowed, eleven rays to the anal fin, the upper parts of the body and the sides marked with red spots encircled with brown, and the lower jaw somewhat longer than the upper.

These fish inhabit fresh-water rivers, streams, and lakes, but particularly those of mountainous countries; and their weight is seldom more than four or five pounds.

In clear and cold streams the fresh-water trout multiplies very fast, and chiefly because such streams do not contain any voracious fish of greater power than themselves. Such is the excellence of these fish that it has frequently been considered desirable to keep them in ponds or preserves. These should have the water clear and cold, a gravelly or sandy bottom, and be constantly supplied by a stream. The ponds should, if possible, be shaded with trees; and should have, at the bottom, roots of trees or large stones, amongst which the fish may find shelter, and deposit their spawn. They should also be supplied with gudgeons, loaches, roach, minnows, and other small fish. To stock these ponds it is recommended to place in them the spawn of the trout, and not the fish themselves, as the former will bear carriage much better than the latter.

Trout are chiefly caught with lines. Their flesh is red, tender, and of excellent flavour; and the colder and more pure the water is the better they are. The best season for trout is from April to June: and, during

the winter, their flesh is white and ill-tasted. In many countries the nobility reserve these fish for their own use, and the capture of them is forbidden under very severe penalties.

So numerous are trout in some of the mountainous parts of the Continent, that, having little or no sale for them, the inhabitants *salt* and *dry* them for their winter's food.

In certain lakes of the province of Galway, and other districts of Ireland, there is a kind of trout called *Gillaroo trout*, which are remarkable for the great thickness of their *stomachs*. These, from their resemblance to the organs of digestion in birds, are sometimes called gizzards; and, in the largest fish, they are equal in bulk to the gizzard of a turkey. The trout themselves are bad eating; but the stomachs are much esteemed for their fine flavour, and are in frequent request for the table.

235. *CHARR* (*Salmo alpinus* ?) are a species of salmon which inhabit the lakes of mountainous countries: there are three kinds or varieties of them, called gilt charr, red charr, and case charr. Their bodies are spotted; and those of the first are of a golden colour, of the second full red, and of the case charr pale red. Their tails are forked. When full grown these fish are about ten inches in length.

They are found in Ullswater, Winandermere, and some other lakes in the north of England, in a lake near Snowdon in North Wales, and in lakes of several parts of the Continent.

There are no fish of the salmon tribe more esteemed for the table than these. The *gilt charr* are considered in highest perfection, and are caught in greatest numbers, from the end of September until the end of November, and the *case charr* about the month of May. During the summer-time all the kinds of charr sink to the bottoms of the lakes far out of the reach of the fishermen. They are usually caught with nets called breast-nets, which are about twenty-five fathoms long and five in depth.

Their flesh is of red colour, and their flavour peculiarly delicate. Great numbers of charr are potted every year, and sent to London. But of the fish which are sold under the name of potted charr many are trout; and, even in the pots which contain charr, trout are frequently to be found. In the river Petteril, which runs near Carlisle, there is a kind of trout which, both in size and colour, are so like charr that they can scarcely be distinguished from that fish.

236. *The SMELT, or SPARKLING* (*Salmo eperlanus*), is a small fish of the salmon tribe, known by its silvery and semi-transparent appearance, the first dorsal fin being further from the head than the ventral fins, the under jaw being longer than the upper and curved, and the tail being forked.

Its length seldom exceeds seven or eight inches.

These fish abound on the shores of most of the countries of Europe; and, during their spawning season, they ascend the rivers sometimes in immense shoals.

About the month of November smelts begin to leave the deep water, and approach the coasts, for the purpose of depositing their spawn in the rivers. This they do in the ensuing months of March and April; and they are caught, in vast abundance, in the Thames, during this time. When in perfection, they are not only a delicious, but are considered as nutritious fish, and easy of digestion. Their name is derived from their very singular smell, and is nothing more than a contraction of "smell it." These fish are sometimes split, salted, and dried; and sold under the name of *dried sparlings*.

237. *UMBER, or GRAYLING* (*Salmo thymallus*), is a fish of the salmon tribe, distinguished by having several longitudinal streaks upon its body, the first dorsal fin nearer the head than the ventral fins, the upper jaw longer than the lower one, the side line nearly straight, and the tail forked.

A fish of this species, which weighed five pounds, was caught some years ago in the river Severn.

The umber inhabits clear and rapid streams of Europe and Siberia.

These fish are so much esteemed in some parts of the Continent, that they are exclusively reserved for the tables of the nobility. They are fattest in the autumn, but are best in season during the winter, particularly when the weather is cold; and they cannot be dressed too soon after they are caught. Many of the old medical writers strongly recommended umber as a wholesome fish for sick persons: they also stated that an oil prepared from its fat would obliterate freckles and other spots on the skin. By the Laplanders the intestines are frequently employed as a substitute for rennet, to coagulate the milk of the rein-deer, when used for the making of cheese.

These fish are in great esteem by anglers on account of their vivacity, the eagerness with which they rise at a bait, and their rapid motions in the water. They lurk close all the winter, and begin to be very active in April and May, about which time they deposit their spawn.

238. *The PIKE, or JACK (Esox lucius), is a voracious fresh-water fish, with large teeth, a compressed head and muzzle, the part of the head betwixt the nape and the eyes elevated and rounded; and the dorsal, anal, and caudal fins marked with black spots.*

These fish sometimes attain so large a size as to weigh upwards of thirty pounds.

They are found in deep rivers, and in lakes of nearly all parts of Europe, in some of the northern districts of Persia, and in North America.

Common as pike now are in our fresh-water rivers, it has been asserted that they were originally introduced from the Continent in the reign of Henry the Eighth. This, however, cannot be the fact, as they were known in England long before that period. Mr. Pennant speaks of these fish being formerly so rare in this country, that a pike, in the month of February, was sold for double the price of a house-lamb. If caught in clear and tolerably rapid waters, these fish, though bony

and dry, are not bad eating. In some parts of Germany they are salted, smoked, and barrelled for exportation to other countries.

The modes of catching pike are very various, by nets, with lines, and snares of different kinds. Their voracity is so great that they not only eagerly seize a bait, but one pike has been known to choke itself by swallowing another of its own species, which proved too large a morsel.

These fish are chiefly partial to still and shady waters, where the bottom is of sand, clay, or chalk. They spawn in March or April. When in high season, their colours are green spotted with yellow; but, when out of season, the green changes to grey, and the yellow spots turn pale. The age to which they live has not been ascertained, though there appears sufficient evidence of their existing for more than a century. As to their size, we are informed that, in the river Shannon, in Ireland, they have been found of nearly seventy pounds in weight; and, in some of the continental lakes, they are said to be more than eight feet long, and from eighty to a hundred pounds in weight.

239. *The SEA-PIKE, or GAR-FISH* (*Esox belone*, Fig. 69), is a fish of the pike tribe, of green colour on the upper part, serpentine shape, with long and narrow jaws, the lower one considerably shorter than the upper. The bones are of green colour when they have been exposed to strong heat.

These fish generally are about a foot and a half in length, and weigh from one to three pounds. The late Sir William Hamilton, however, mentioned one caught near Naples which weighed fourteen pounds, and was sent to the King as a great curiosity.

They are found in the ocean in nearly all parts of Europe.

The gar-fish begin to approach our coasts, in considerable shoals, about the month of March, shortly after which they deposit their eggs in smooth and shallow water. Their flavour is not much unlike that of mackrel, though many persons have a great antipathy

to them, in consequence of the green colour of the bones.

240. *The WHITE, or COMMON MULLET* (*Mugil cephalus*) is a fish distinguished by having the lower jaw angular upwards, several narrow and dark-coloured stripes on each side of the body, a toothed process betwixt the eye and the opening of the mouth, and the gill-covers angular behind and covered with scales.

The weight of these fish is four or five pounds and upward.

They inhabit the seas of nearly all the southern parts of Europe, and annually enter the mouths of almost all the great rivers.

Vast shoals of mullets are frequently observed, about the months of May, June, and July, swimming, near the surface of the water, in harbours, and in rivers adjacent to the sea. They are caught with nets, but are so cunning, that, even when entirely surrounded, they will sometimes nearly all escape, either by leaping over or by diving under the nets.

These fish are in considerable request for the table, and are in best season about the month of August. Their flesh, however, is, in many instances, woolly and bad; and the great quantity of oil which is found beneath the skin renders them, to some persons, very unpleasant. In several places on the coast of the Mediterranean mullets are dried and smoked for exportation.

Of the roes of mullets is sometimes made the kind of caviar called *botargue* or *botargo*. For this purpose they are taken out and covered with salt, for four or five hours. Afterwards they are gently pressed between two boards or stones, to squeeze the water out of them. They are then washed in a weak brine, and lastly exposed to the sun for twelve or fifteen days to be dried. This substance is said to quicken a decayed appetite, and to give a relish to wine. It is much in request, in Greece, as food on the numerous fast-days of the Greek church.

241. *The HERRING* (*Clupæa harengus*) is a small fish

distinguished by its sharp and serrated belly, the body being without spots, the lower jaw longer than the upper, and the dorsal fins so exactly situated above the centre of gravity that, when taken up by it, the fish will hang in equilibrio.

These fish, which are in general from eight to ten inches in length, are migratory, and found, at particular periods, in immense shoals, in nearly all parts of the Northern Ocean.

So great is the supply of herrings, and such is the general esteem in which they are held, that they have almost equal admission to the tables of the poor and the rich. They have been known and admired from the remotest periods of antiquity; but, as our ancestors were ignorant of the means by which they could be preserved from corruption, they were not so profitable to them as they are to us.

The herring fishery, in different parts of the world, affords occupation and support to a great number of people. In Holland it has been calculated that formerly more than 150,000 persons were employed in catching, pickling, drying, and trading in herrings; and, on the different coasts of our own country, many thousands of families are entirely supported by this fishery. The principal of the British herring fisheries are off the coasts of Scotland and Norfolk; and the implements that are used in catching the fish are nets stretched in the water, one side of which is kept from sinking by buoys fixed to them at proper distances, and the other hangs down, by the weight of lead which is placed along its bottom. The herrings are caught in the meshes of the nets, as they endeavour to pass through, and, unable to liberate themselves, they continue there until the nets are hauled in and they are taken out.

Herrings are in full roe about the month of June, and continue in perfection until the commencement of winter, when they begin to deposit their spawn.

The art of pickling these fish is said to have been first discovered towards the end of the fourteenth century, by Guillaume Beuchel, a native of Brabant. The

Emperor Charles the Fifth, about 150 years afterwards, honoured this benefactor of the human race by visiting the place of his interment, and eating a herring on his grave.

Yarmouth, in Norfolk, is the great and ancient mart of herrings in this country. The season for catching them commences about Michaelmas, and lasts during the whole month of October; and generally more than 60,000 barrels are every year cured in the neighbourhood of that town. Some of these are *pickled*, and others are dried. In the preparation of the latter (which have the name of *red herrings*) the fish are soaked for twenty-four hours in brine, and then taken out, strung by the head on little wooden spits, and hung in a chinney formed to receive them. After this a fire of brush-wood, which yields much smoke but no flame, is kindled beneath, and they are suffered to remain until they are sufficiently dried, when they are packed in barrels for exportation and sale.

It will afford some idea of the astonishing supply of these invaluable fish, when it is stated that, about seventy years ago, near 400,000 barrels of herrings were annually exported from different parts of the coast of Norway; that, previously to the late war, about 300,000 barrels were annually cured by the Dutch fishermen; and that a considerably greater quantity than this is every year obtained on the coasts of Great Britain and Ireland.

There is, in some countries, a considerable trade in the *oil* that is obtained from herrings during the process of curing them. The average annual quantity of this oil exported from Sweden is about 60,000 barrels.

242. *The PILCHARD* (*Clupæa pilcardus*) is a fish of the herring tribe, and so nearly resembling the common herring, that the best mode of distinguishing the one from the other appears to be by the situation of the dorsal fin. If the pilchard be held by this fin, the head will dip downward; the herring held in similar manner continues in equilibrio.

The length of the pilchard is from eight to about ten inches.

These fish annually appear in vast shoals off the coast of Cornwall, and some other south-western parts of England. Their utmost range seems to be the Isle of Wight in the British, and Ilfracomb in the Bristol channel.

To the inhabitants of Devonshire and Cornwall the pilchard fishery is of as much importance as that of herrings is to the people on the eastern and northern coasts of Britain. Many hundred families are almost wholly supported by it. The first appearance of the fish is generally about the middle of July, and they usually continue until the latter end of October.

As soon as the pilchards are caught they are conveyed to a warehouse, where they are covered with bay-salt, and suffered to lie for three weeks or a month. After this they are washed in sea-water and dried. As soon as they are dry the fish are closely pressed into barrels to extract the oily particles from them, which drain through holes that are made in the bottom. Thus prepared they become fit for use, and, when properly dressed, they are considered preferable to herrings.

Pilchards are generally caught in nets. These are sometimes 200 fathoms in length, and about eighteen fathoms deep. The approach of the shoals is known by great numbers of sea-birds which accompany and prey upon them; and the progress of the shoals is marked by persons who are stationed on the cliffs to point them out to the fishermen, and who are called *huers*; from their setting up a hue for this purpose.

The principal towns in the neighbourhood of which pilchards are caught are Fowey, Falmouth, Penzance, and St. Ives; and the average annual quantity that is sent to market is about 30,000 hogsheds.

243. *The SHAD (Clupæa alosa) is a species of herring known by the belly being strongly serrated and covered with large transverse scales, the sides being marked with round black spots placed longitudinally, and the under jaw sloping upward.*

These fish weigh from half a pound to four or five pounds and upwards.

They are found on the shores of all the temperate and warm

countries of Europe, and, at certain seasons of the year, they ascend the rivers, to considerable distances, in order to deposit their spawn.

In the Thames and Severn these fish are generally found in the months of April, May, and June. Those that are caught in the Thames are coarse and insipid; whilst such as are caught in the Severn, especially that part of it which flows by Gloucester, are generally sold at a higher price than salmon. Shad that are taken in the sea are thin and of bad flavour, and the longer they continue in the rivers the fatter and more eatable they become. They are generally caught in nets, but sometimes with lines having an earth-worm for a bait. The London fishmongers are frequently supplied with shads from the Severn. These are distinguished by the name of *allis*, or *alose*, the French name for shad.

244. *The SPRAT (Clupæa sprattus) is a very small fish of the herring tribe, distinguished by its belly being strongly serrated, the dorsal fin having seventeen rays, the anal fin nineteen, and the ventral fins each six.*

It seldom exceeds the length of about five inches, and is generally much smaller.

These fish are caught on most of the British shores, and they ascend the river Thames nearly as high as London Bridge, in the beginning of November, and leave it in the month of March.

To the lower classes of inhabitants in London, during the winter, sprats afford a cheap and very acceptable supply of food. They are caught in nets, and, in some instances, as many have been taken at a single haul as would have filled thirty barrels. Sprats are generally eaten fresh, though, both at Gravesend and Yarmouth, they are cured in the manner of red herrings. In some countries they are pickled, and, in this state, they are little inferior to anchovies, though the bones will not dissolve like those of anchovies.

Immense numbers of sprats, larger in size than ours, are every year caught on the coast of Sardinia.

These are salted, packed in barrels, and exported to various parts of the world under the name of *Sardines*.

245. The ANCHOVY (*Clupæa encrasicolus*) is a small fish of the herring tribe, known from all the others by its upper jaw being considerably longer than the under jaw.

These fish seldom exceed the length of four or five inches.

They are chiefly caught in the Mediterranean, and the principal fishery for them is on the shores of Gorgona, a small island west of Leghorn. They are also caught off the coast of France, and occasionally off our own shores.

There are few persons fond of good eating to whom the anchovy, either in the form of sauce or as an article of food, is unknown. With us, however, it is seldom eaten in a recent state, the greater proportion of the anchovies consumed in this country being brought in pickle from the Méditerranæan.

They are generally caught in nets during the night, being attracted together by fires lighted on the shore, or by torches fixed to the boats which are engaged in the fishery. As soon as they are caught the heads are cut off and the entrails taken out; after this they are salted, or pickled, and packed in barrels or earthen vessels for exportation.

In the choice of anchovies such should be selected as are small, round-backed, fresh pickled, whitish on the outside and red within. The most effectual method of concentrating the excellences of these fish is to reduce the fleshy part to a soft pulp, and to boil this gently, for a few minutes, with a certain proportion of water and spices. The substance thus prepared is denominated *essence of anchovies*.

246. The CARP (*Cyprinus carpio*, Fig. 70) is a fresh-water fish known by having one dorsal fin, three bony rays to the gill membrane, the mouth with four fleshy beards, the second ray of the dorsal fin serrated behind, and the body covered with large scales.

These fish sometimes grow to a very large size.

They inhabit slow and stagnated waters in various parts of

Europe and Persia, and were first introduced into England about the year 1514.

Carp are a useful species of fish for the stocking of ponds, and for the supply of the table. In Polish Prussia they are an important article of commerce; being sent alive in well-boats to Sweden, Russia, and other parts. They are bred by the principal landholders of the country, to whom, in many instances, they yield a very important revenue. If the rearing of carp were better understood and practised in the marshy parts of England than it now is, they would amply repay every expence and trouble that might be bestowed upon them. The increase of these fish is very great: we are informed by Bloch that four male and three female carp, put into a large pond, produced in one year an offspring of no fewer than 110,000 fish. They are also extremely long lived, instances having occurred of carp living to the age of considerably more than 100 years. To fatten carp and increase their size, the growth of vegetation in the ponds where they are kept should be particularly attended to, as, during the summer-time, they principally feed upon this. In winter, when the ponds are frozen over, care must be taken to break the ice, that they may have access to the atmospheric air, without which, if they are in great numbers, they will die.

Carp are much esteemed as food, but a principal part of their excellence depends on the mode in which they are cooked. They are best in season during the autumnal and winter months. The usual mode of catching them is with nets, and the most proper time at day-break. These fish, if kept in a cellar, in wet hay or moss, and fed with bread and milk, will live many days out of the water, and will even become fat.

With the roes of carp, in the eastern parts of Europe, a kind of *caviar* is made, which is sold in considerable quantity to the Jews, who hold that of the sturgeon in abhorrence. The *sounds*, or air-bladders, of

carp are converted into a species of isinglass, and their gall is in much repute, with the Turks, for staining paper and for making a green paint.

247. The *TENCH* (*Cyprinus tinca*, Fig. 63) is a fish of the carp tribe, distinguished by its mouth having only two beards, the scales being small, the fins thick, and the whole body covered with a slimy matter.

The weight of these fish seldom exceeds four or five pounds, but instances have occurred of their weighing more than eleven pounds.

They are found in stagnant waters in nearly all the temperate parts of the globe.

There are not many fresh-water fish that are more excellent for the table than these; yet the ancient Romans so much despised them, that they were eaten by none but the lowest classes of the people. In the kingdom of Congo, on the contrary, they were formerly so much esteemed that they were allowed only to be eaten at court, and any person was liable to the punishment of death who caught a tench and did not carry it to the royal cook. Such tench as are caught in clear waters are much superior to those which have inhabited muddy places. They thrive best in still waters, where there are weeds at the bottom; and they are in season from the beginning of October until the end of May.

248. The *GUDGEON* (*Cyprinus gobio*) is a small fish of the carp tribe, with a thick and round body, two fleshy beards near the mouth, and the dorsal and caudal fins spotted with black.

Its length is usually about six inches, and its weight seldom more than three or four ounces.

This fish is an inhabitant of gentle streams, with gravelly or sandy bottom, in most of the northern parts of Europe.

The flesh of gudgeons is white, firm, and of excellent flavour; but the smallness of their size prevents these fish from being much in demand. They are found in small shoals near the bottom of the water; and are caught both with nets and lines. The bait that is

used is generally a small earth-worm, which they seize with great eagerness. The season when they are in greatest perfection is from September till the end of the year.

Gudgeons are found to thrive well in ponds, if these be fed by brooks running through them. Under favourable circumstances they have sometimes attained an unusually large size. They feed on aquatic plants, worms, water-insects, and the spawn of fish.

249. *The BLEAK (Cyprinus alburnus) is a small fish of the carp tribe, with somewhat pointed muzzle, and no beards; and the scales thin, shining and slightly attached.*

It seldom exceeds the length of five or six inches.

These fish inhabit fresh-water rivers, in nearly all the temperate parts of Europe, and are extremely common in many of those of our own country.

There is, in Paris, a great consumption of bleaks on account of their *scales*, which are used in the manufacture of *artificial pearls*. The scales are scraped off into clear water, and beaten to an extremely fine pulp. After this the water is several times changed until they are entirely free from colour. The silvery matter that is left precipitates to the bottom; and the water is carefully poured off from it, by inclining the vessel. This substance, mixed with a little size, is introduced, in small quantity, into thin glass bubbles, by a slender pipe, and moved about until their whole interior surface is covered. The remaining part of the bubble is then generally filled with wax. The inventor of this art was a Frenchman of the name of Jannin, a bead merchant in Paris.

In some countries bleaks are pickled in the manner of anchovies. When of large size they are well flavoured, but they are too bony to be in much request as food, even by the poor. They are considered in greatest perfection in the autumn.

ORDER VI.—CHONDROPTERIGIOUS FISH.

250. The COMMON STURGEON (*Acipenser sturio*, Fig. 71), is a large kind of sea-fish with five rows of bony tubercles along the body; the mouth beneath the head, and four fleshy beards betwixt the mouth and the extremity of the muzzle.

This fish sometimes grows to the length of sixteen feet and upwards.

It inhabits the European and American seas, and annually ascends the rivers in the early part of the year.

It is to this and to a still larger species of sturgeon called the BELUGA (*Acipenser huso*), which is found in the river Wolga, that we are indebted for much of the well-known substance called *isinglass*. The mode of making isinglass was long kept a secret by the Russians, and has only of late years been made public. This article consists of certain membranous parts of fishes deprived of their viscous quality and properly dried. The sounds, or air bladders, are those of which it is chiefly made. They are taken out, while sweet and fresh, slit open, washed from their slime, divested of a very thin membrane which envelopes them, and then left to stiffen in the air. After this they are formed into rolls, each about the thickness of the finger, and put into the shape in which we see them, by small wooden pegs, and left to dry. The kind called *cake isinglass* is formed of bits and fragments put into a flat metal pan with very little water, heated just enough to make the parts adhere, and subsequently dried in the air.

Although by far the greatest quantity of isinglass is obtained from the beluga, as being the largest and most abundant fish in the rivers of Muscovy, yet it has been ascertained that this substance may be made from the air-bladders of every species of fresh water fish. The principal consumption of isinglass is by brewers and others, for the fining of fermented liquors: this it appears to do merely by the mechanical effect of its organization, which forms a kind of strainer, or

fine net-work, and carries the gross impurities before it, as it subsides. It is sometimes employed in medicine; and also in cookery, for making jellies, and other purposes.

Caviar is a kind of food made generally from the roes of the sturgeon. For this purpose they are washed, when fresh, by rubbing them, with the hands, in a sieve, to free them from the fibres by which the several eggs are connected together. They are then washed in white wine or vinegar, and spread out to dry. After some further processes, they are either formed into cakes, each about an inch in thickness and three or four inches in diameter, or they are packed in small kegs for use.

The *flesh* of the sturgeon is firm, white, and of excellent flavour; and, by some persons, has been compared to veal. It is considered best when roasted; though it is commonly sold in a pickled state, and, in this state, is chiefly imported from the rivers of the Baltic and North America. All sturgeons that are caught near London are taken to the Lord Mayor, and are by him presented to the King. In Italy the *back bones* of these fish are cut into pieces, salted and smoked for food. The Russians frequently convert the *skins* of sturgeons into a kind of leather, which they use for the covering of carriages.

251. The SHARKS and DOG-FISH (*Squalus*, Fig. 64) constitute a tribe of sea-fish noted for their voracity, and peculiarly characterized by having, instead of gills, from four to seven breathing apertures, of curved form, on each side of the neck.

They are found in all seas, and some of them are of enormous magnitude, measuring from twenty to thirty feet and upwards in length.

The *skins* of nearly all these animals, which are rough, with hard and minute prickles, are in frequent use for polishing wood, ivory, and even iron. Those of the larger species are cut into thongs and traces for carriages; and, in Norway, a sort of leather is prepared from them, which is employed for shoes and many other purposes. The skin of the SPOTTED

DOG-FISH (*Squalus canicula*) is converted into the well-known substance called *shagreen*, or *chagreen*. For this purpose it is extended on a board and covered with mustard seed; and, after having been exposed for several days to the effects of the weather, it is tanned. The best shagreen is imported from Constantinople. This is of brownish colour, and very hard; but when immersed in water, it becomes soft and pliable, and may be dyed of any colour. Shagreen is often counterfeited by preparing morocco leather in the same manner as the skins of the dog-fish. Such fraud may, however, easily be detected by the surface of the spurious manufacture peeling or scaling off, whilst that of the genuine article remains perfectly sound. Shagreen is employed principally to cover cases for mathematical instruments, and was formerly used for watch-cases and the covers of books. *Sharks' fins* are an article of trade from the Arabian and Persian gulfs to India, and thence to China: they are generally packed in bales weighing each about 700 pounds.

The *flesh* of all the species of sharks is hard, and in general unpleasant both to the smell and the taste; yet it is sometimes eaten by seamen, after having been macerated for a while in water to soften it. The *eggs* of sharks are also eaten. The *livers* of all the species yield a considerable quantity of oil, which is useful for burning and for other purposes. From the livers of some of the larger kinds as much as seven or eight butts of oil have been obtained, worth twenty or thirty pounds and upwards.

252. The SKATE (*Raia batis*, Fig. 72) is a species of ray of large size, with flat and somewhat diamond-shaped body, and the mouth on the under side: the teeth sharp, and a single row of spines in the tail.

It is found in almost every part of the European ocean.

No fish of its tribe is so excellent for the table as the skate, particularly when it is young and has not fed in

a muddy part of the sea. The flesh is white and of good flavour, but is usually crimped before it is cooked. The best season for skate is from January to March; and from July to September. So great is the size which these fish sometimes attain, that Willoughby mentions one that would have served 120 men for dinner. In several parts of the Continent skate are salted and dried for sale. The fishermen also sometimes dry the *stomach* as an article of food; and extract from the *liver* a white and valuable kind of oil.

253. The THORNBACk (*Raia clavata*) is a species of ray, which differs from the skate chiefly in having blunt teeth, and a row of curved spines along the middle of the body and on the tail.

This is a very common fish near all the coasts of Britain.

The flesh of thornback is much inferior to that of the skate, yet it is sometimes eaten. That of the young ones, which have the denomination of *maids*, is however peculiarly excellent. The Norwegian fishermen catch thornbacks chiefly on account of their *livers*; from these they extract a considerable quantity of oil, which they sell with great advantage to strangers who frequent their harbours.

254. The TRUE LAMPREY (*Petromyzon marinus*, Fig. 73) is an eel-shaped fish having seven breathing-holes on each side of the neck, and somewhat oblong mouth with many rows of yellowish pointed teeth disposed in a circular form.

These fish are of dusky colour, irregularly marked with dirty yellow; and they sometimes weigh four or five pounds each.

They are sea-fish, but, at certain seasons, they ascend the rivers to deposit their eggs.

Lampreys are celebrated as forming an excellent dish for the table; and they have, at all times, been held in great esteem by epicures, particularly when potted or stewed. The death of one of our monarchs, Henry the First, has been attributed to a too plentiful repast which he made of these fish. Lampreys are in best season during the month of March, April, and May;

at which time they are caught in the rivers. The Severn is peculiarly celebrated for them; and the city of Gloucester, which is situated on that river, is required, by ancient custom, to present annually to the King, at Christmas, a lamprey pie with raised crust. And as, at that early season, lampreys are very scarce, it is not without difficulty that the corporation is able to supply the proper quantity.

These fish are caught in various ways, but particularly in osier pots or baskets formed to entrap them, and also in nets. In some parts of the country they are boiled, and afterwards packed into barrels with vinegar and spices.

255. *The LESSER LAMPREY* (*Petromyzon fluviatilis*) is a fresh-water fish, distinguishable from the true lamprey by its much smaller size, the second dorsal fin being angular and connected with the caudal fin, and having a single row of teeth placed circularly in the mouth.

This fish seldom exceeds the length of eight or ten inches.

It is found in the rivers of most parts of Europe, America, and Asia; and particularly in those of Brandenburg, Pomerania, Silesia, and Prussia.

In the spring of the year these fish are frequently seen sticking, by their mouth, to stones in shallow water, from which they may easily be taken with the hand. They are considered a very delicious fish for the table, in whatever way they are cooked. The best season for them is betwixt the months of December and April.

Great numbers of Lesser Lampreys are caught in the Severn, the Dee, and the Thames; but particularly in the latter, near Mortlake in Surrey. Anterior to the late war more than 400,000 of them were annually sold to the Dutch as bait for cod, turbot, and other large fish.

CLASS V.—INSECTS.

256. The *SPANISH FLY*, or *BLISTERING LYTTA* (*Lytta vesicatoria*), is a coleopterous insect (12), about an inch in length, of shining blue-green colour with black antennæ.

It is found in most parts of Europe, and feeds on the leaves of the ash, poplar, elder, lilac, and other trees.

These insects, which are known in medicine by the name of *cantharides*, are of incalculable importance to mankind, as the basis of blistering plasters, and also as an internal remedy against many diseases. We import them in a dried state, from Spain, Italy, and the South of France; in many parts of which countries, about the middle of summer, they are found in vast abundance. As they are generally in a torpid state during the day, they are easily collected, by shaking them from the trees upon a cloth spread on the ground to receive them. When a sufficient number has been collected they are tied in bags, and killed by being held over the fumes of hot vinegar. After this they are dried in the sun, and packed in boxes for sale. The odour which is emitted by these insects is peculiarly nauseous, and so powerful, that great injury has sometimes been experienced by persons employed in picking them, and by those who have even fallen asleep under the trees where they abound.

Previously to being used they are pounded; and if, in this state, they be applied to the skin, they first cause inflammation, and afterwards raise a blister. The usual blistering plaster is formed with Venice turpentine, yellow wax, Spanish flies, and powdered mustard.

257. The *PALM-TREE GRUB*, or *GRUGRU*, is the larva or caterpillar of a coleopterous insect (12), the palm-tree weevil (*Curculio palmarum*), which is about two inches in length, of black colour, and has the elytra or wing cases shorter

than the body, and streaked or marked with several longitudinal lines.

This insect is found in Cayenne, Surinam, and other parts of South America.

It deposits its eggs on the summit of the palm-tree; and the grubs that issue from these eggs subsist on the soft interior parts of the tree. They become about the size of the thumb, and are much sought after in many places for the table. They are generally eaten roasted, and are considered a peculiar delicacy. We are informed, by Ælian, of an Indian king, who for a dessert, instead of fruit, set before his Grecian guests a dish of roasted worms taken from a plant: these were probably the present insects, or a kind nearly allied to them.

258. *The LOCUST (Gryllus migratorius) is an insect, not much unlike our large grasshoppers, which is too common in most of the eastern countries.*

It is about two inches and a half in length, has a brownish body varied with darker spots, blue legs and jaws, the hind thighs yellowish, and the wings of yellowish brown colour spotted with black.

We are informed, in the New Testament, that the food of John the Baptist in the wilderness was "locusts and wild honey." Some of the commentators have imagined the locusts here mentioned to have been a vegetable production—a species of pulse; but this opinion will scarcely be admitted when it is known that the insects of this name, even at the present day, serve as food to many of the eastern tribes. The Ethiopians and Parthians are recorded, from the earliest periods of antiquity, to have occasionally subsisted on this species of food. And the traveller Hasselquist, in reply to some inquiries which he made on this subject, was informed that, at Mecca, when there was a scarcity of grain, the inhabitants, as a substitute for flour, would grind locusts in their hand-mills, or pound them in stone mortars: that they mixed the substance thus formed with water, and made cakes of it; and that they

baked these cakes, like their other bread. He adds, that it was not unusual for them to eat locusts when there was no famine; but that, in this case, they boiled them first in water, and afterwards stewed them with butter into a kind of fricasee. The Hottentots delight in locusts as food, and even make their eggs into a kind of soup. Some of the African tribes pound and boil these insects with milk; and others eat them, after being merely broiled for a little while on the coals. Mr. Jackson says that, when he was in Barbary, in 1799, dishes of locusts were frequently served at the principal tables, and were esteemed a great delicacy. These insects are preferred by the Moors to pigeons; and it is stated that a person may eat 200 or 300 of them without experiencing any ill effects.

259. LAC is a resinous substance, the production of an hemipterous insect (*Coccus ficus*), which is found on three or four different kinds of trees in the East Indies.

The head and trunk of the lac insect seem to form one uniform, oval, and compressed red body, about the size of a flea. The antennæ are thread-shaped, and half the length of the body. The tail is a little white point, whence proceed two horizontal hairs as long as the body.

These insects pierce the small branches of the trees on which they feed; and the juice that exudes from the wounds is formed by them into a kind of cell, or nidus for their eggs. Lac is imported, into this country, adhering to the branches, in small transparent grains, or in semi-transparent flat cakes. Of these the first is called *stick lac*, the second *seed lac*, and the third *shell lac*.

On breaking a piece of stick lac it appears to be composed of regular honeycomb-like cells, with small red bodies lodged in them; these are the young insects, and to them the lac owes its tincture; for, when freed from them, its colour is very faint. Seed lac is the same substance grossly pounded and deprived of its colouring matter, which is used in dyeing, and for

other purposes; and shell lac consists of the cells liquefied, stained, and formed into thin cakes.

This substance is principally found upon trees in the uncultivated mountains on both sides of the river Ganges; and it occurs in such abundance, that, were the consumption ten times greater than it is, the markets might readily be supplied. The only trouble which attends the procuring of it is to break down the branches of the trees and carry them to market.

The uses of lac, in its different states, are various. It is employed in the East Indies for making rings, beads, chains, necklaces, and other ornaments for female attire. Mixed with sand, it is formed into grind-stones; and added to lamp-black or ivory-black, being first dissolved in water with the addition of a little borax, it composes an ink, which, when dry, is not easily acted upon by moisture. A red liquor obtained from lac is employed as a substitute for cochineal (227) in dyeing scarlet, and in painting. Shell lac is chiefly adopted in the composition of varnish, japan, and sealing-wax. A tincture prepared from lac is sometimes used in medicine.

260. *COCHINEAL* is a scarlet dyeing drug, which is chiefly imported from Mexico and New Spain, and is the production of a small hemipterous insect (*coccus cacti*) that is found on the prickly pear (*cactus opuntia*) and some other trees.

The male is winged, and the female not. The latter is of an oval form, convex on the back, and covered with a white downy substance resembling the finest cotton. The antennæ are half as long as the body, and the legs are short and black.

Cochineal is one of the most valuable substances that are used in dyeing. As imported into this country, it is in the form of a reddish shrivelled grain, covered with a white bloom or powder.

The cochineal insects adhere in great numbers, and in an apparently torpid state, to the leaves of the prickly pear. At a certain period of the year they are

carefully picked or brushed off, either by a bamboo twig shaped somewhat into the form of a pen, or by an instrument formed of a squirrel's or stag's tail: and so tedious is the operation, that the persons employed in it are sometimes obliged to sit for hours together beside a single plant. In some parts of South America the insects, after being collected in a wooden bowl, are thickly spread upon a flat dish of earthen ware, and cruelly placed alive over a charcoal fire, where they are slowly roasted, till their downy covering disappears, and they are perfectly dried. In other parts they are killed by being thrown into boiling water, by being placed in ovens, or being exposed in heaps to the sun.

The quantity of cochineal annually exported from South America is said to be worth more than 500,000*l.* sterling, a vast sum to arise from so minute an insect; and the present annual consumption of cochineal in England has been estimated at about 150,000 pounds' weight.

It is for dyeing scarlet that cochineal is chiefly in demand; but although a peculiarly brilliant dye is now obtained from it, this substance gave only a dull crimson colour until a chemist of the name of Kuster, who, about the middle of the seventeenth century, lived at Bow, near London, discovered the art of preparing it with a solution of tin. Cochineal, if kept in a dry place, may be preserved, without injury, for a great length of time. An instance has been mentioned of some of this dye, 130 years old, having been found to produce the same effect as though it had been perfectly fresh.

The attention of the East India Company has, for many years, been directed to the production of cochineal in the East, but hitherto with little success. That which has been brought from India is very small, and greatly inferior to what is imported from New Spain.

An imitation of cochineal is made by a preparation of bullock's blood, and some other ingredients.

261. The *SILK-WORM* is a smooth and somewhat lead-coloured caterpillar, produced from the eggs of a moth (*Phalæna mori*) which is found in great abundance in China, the East Indies, the Levant, several parts of Italy, and the South of Spain.

So great is the importance of *silk*, in a commercial view, that, in most of the Eastern countries of the world, a close attention is paid to the growth and cultivation of the insects by which it is produced. Each moth lays about two hundred small straw-coloured eggs. As soon as the worms are hatched they are fed with the tenderest leaves of the mulberry-tree, or with these leaves chopped very fine; and, when they have attained sufficient strength, they are removed into wicker baskets, or placed upon shelves made of wicker-work. Here they feed for about thirty days, until they are full grown, when they are furnished with little bushes of heath or broom. On these they spin the nests in which they are about to change into chrysalids. These nests have the general name of cocoons, and consist of somewhat oval-shaped balls of silk, of marigold colour. The exterior of the cocoon is composed of a rough cotton-like substance, called *floss*. Within this is the thread, which is more distinct and even; and appears arranged in a very irregular manner, winding off first from one side of the cocoon, and then from the other. Previously to the silk being wound from the cocoons they are baked for about an hour to kill the chrysalids they contain. When the silk is to be wound off, the cocoons are put into small coppers or basins, of water, each placed over a small fire. The ends of the threads are found by brushing the cocoons gently with a whisk made for the purpose; and so fine are these threads that eight or ten of them are generally rolled off into one. In winding them, they are each passed through a hole in an horizontal iron bar placed at the edge of the basin, which prevents them from being entangled.

The art of manufacturing silk was known to the

ancients; but in Europe this commodity, long after its invention, was of very great value. We are informed that, in the third century, the wife of the Roman Emperor Aurelian entreated him to give her a robe of purple silk, and that he refused this under an allegation that he could not buy such a robe for its weight in gold.

It is not certain at what precise period the silk manufacture was first introduced into England. But, in the year 1242, we are told that part of the streets of London were covered or shaded with silk, for the reception of Richard, the brother of Henry the Third, on his return from the Holy Land. In 1454 the silk manufactures of England are said to have been confined to ribbons, laces, and other trifling articles. Queen Elizabeth, in the third year of her reign, was furnished by her silk-woman with a pair of black knit silk stockings, which she is stated to have admired as "marvellous delicate wear;" and after the using of which she no longer had cloth ones, as before. James the First, whilst king of Scotland, requested of the Earl of Mar the loan of a pair of silk stockings to appear in before the English ambassador, enforcing his request with this cogent appeal, "For ye would not, sure, that your King should appear as a scrub before strangers."

China may be said to be the country of silk; indeed it furnishes large quantities of raw silk to all the neighbouring nations, and to Europe; and also for clothing the greatest part of its own inhabitants. There are in China very few, except the lowest orders, who are not clad in silk garments. The best Chinese silk is that which is imported from Nankin.

The principal silk manufacture in England is carried on in Spitalfields, London.

Although the whole of the silk which is produced in Europe, and the greatest proportion of that manufactured in China, is obtained from the common silk-worm; yet considerable quantities are procured, in India, from the caterpillars of other moths. Of these

the most important are the TUSSEH and ARRINDY silk worms (*Phalæna paphia* and *cinthia*), both of which are natives of Bengal and the adjacent provinces. The silk from these kinds of worms has long been used by the natives. The former, which is commonly called tusseh silk, is woven into a coarse and dark-coloured kind of cloth, called *tusseh dooties*, much worn by the Brahmins and other sects of Hindoos. Of the arrindy silk is manufactured a coarse kind of white cloth, of seemingly loose texture, but of almost incredible durability. It is employed as clothing both for men and women; and may be used for more than twenty years without decay. In the washing of it, however, care must be taken to use only cold water, as, if put into boiling water, it will become rotten, and will tear like old and decayed cloth. This kind of silk is not only employed for clothing, but, by merchants, as packing cloths, for silks, shawls, and other fine goods. Some manufacturers in England, to whom the silk was shown, were of opinion that it might be made into shawls, equal in quality to any that we receive from India.

262. The *HIVE-BEE* (*apis mellifica*) is a well-known hymenopterous insect (12), of uniform brown colour, and with somewhat hairy body.

Bees live in extremely numerous societies, either in decayed trees, or in habitations prepared for them by mankind, called hives. Each hive contains, 1, a single female which has the name of queen-bee; 2, about 1600 males, called drones; and, 3, about 20,000 individuals of neither sex, called working-bees. It is upon the latter that the whole trouble devolves of constructing combs, or cells, for the honey and for the eggs deposited by the female; collecting and forming the honey, and feeding the grubs which proceed from the eggs, and which afterwards change into bees.

Bees' wax is the substance of the combs after the honey has been extracted from them. The best kind is hard, compact, of clear yellow colour, and an agreeable odour, nearly similar to that of honey. It is melted, and cast in moulds of different sizes and shapes.

White wax is prepared from common bees' wax by melting it into water, and exposing it, for a considerable time, to the action of the sun, air, and water. When sufficiently bleached, it is cast into thin cakes. The purposes for which wax is applicable are very numerous. Great quantities of white wax are annually consumed in the manufacture of candles; and in making cerates, plasters, and ointments.

Honey is a sweet and fluid substance, which is collected from flowers, and deposited in the combs for support of the bees and their offspring. The honey made by young bees is purer than any other, and is thence called *virgin honey*. Before the discovery of sugar, honey was of much greater importance than it is at present. Yet both as a delicious article of food, and as the basis of a wholesome fermented liquor called *mead*, it is of no mean value even in this country; but in many parts of the Continent, where sugar is much dearer than with us, few articles of rural economy, not of primary importance, would be dispensed with more reluctantly than honey. In the Ukraine some of the peasants have each 400 or 500 bee-hives, and make more profit of their bees than of corn. And in Spain the number of hives is almost incredible: a single parish priest is stated to have possessed 5000.

Bee-hives that are made of straw are usually preferred to any others, as they are not liable to be overheated by the sun; they keep out the cold better than wood, and are cheaper than those formed of any other material. The profit arising from bees, when properly attended to, is very considerable; and, to obtain the greatest possible advantage from them, they should be supplied with every convenience for the support of themselves and their offspring. They should be kept in a good situation; that is, in a country abounding with flowers; at a distance from brew-houses, smelting-works, &c. and in well-constructed hives. In France floating bee-hives are very common. One barge contains from sixty to a hundred hives well defended from

the inclemency of the weather. With these the owners float gently down the stream, whilst the insects gather honey from the flowers along the banks.

Many of the bee-masters in France have an ingenious mode of transporting the loaded bee-hives from one part of the country to another. They are fastened together by laths placed on pack-cloth, which is drawn up on each side, and then tied by a piece of pack-thread several times round the top. In this state they are laid in a cart, and can be carried in safety to very considerable distances.

When the young bees begin to appear, the hives become so much crowded that they *swarm* or separate. This usually takes place in the month of May, or earlier if the season be warm.

In England it is customary, in taking the honey, to destroy the bees, by suffocating them with the fumes of brimstone; but there are modes, which not only humanity but even policy would recommend, of obtaining the honey without injuring the insects.

263. *The COMMON, or BLACK-CLAWED CRAB* (*Cancer pagurus*, Fig. 76), is a crustaceous animal, with smooth shell, of somewhat oval shape, having a margin with nine folds on each side, and the great claws black at the tip.

These crabs inhabit the rocky parts of the sea both of Europe and India.

They are frequently caught at low water of the spring tides, under stones and in crevices of the rocks. But the usual mode is by large wicker baskets made somewhat in the shape of wire mouse-traps, and baited with garbage or fish. When caught, the large claws are tied together, or (with great cruelty) pegged in the joints, to prevent the animals from destroying each other. They are then put into store baskets, which are placed in the sea, until the crabs are wanted for sale. In these they are kept sometimes for many weeks, without any other food than what they can collect from the sea-water.

The principal season for crabs is the spring of the

year; and those of middle size which are the heaviest are best. When in perfection the joints of the legs are stiff, and the body has an agreeable smell. If the eyes look dead and flaccid, the crabs are not fresh.

The article which is used in medicine called *crabs' claws*, consists of the black tips of the claws pounded, well washed in boiling water, and reduced to a fine powder.

264. The *LAND CRAB* (*Cancer ruricola*) is a crustaceous animal, common in some parts of America, the Bahamas, and other islands in the West Indies, which has a rounded shell without margin, and the first joints of the legs spinous, and the second and third furnished with tufts of hair.

The shells of the largest land crabs are about six inches in diameter, and of various colours.

These crabs inhabit the clefts of rocks, the hollows of trees, or holes which they form in the ground. In the early part of the year they descend in myriads to the sea-coast, to deposit their eggs in the sand. They chiefly travel by night, but in rainy weather they also proceed during the day. The inhabitants of the countries where they abound are always eagerly on watch for their migrations towards the sea, and destroy immense numbers of them, disregarding, at this time, the bodies, and only taking out the spawn. It is on their return that the animals themselves are valuable as food.

265. The *LOBSTER* (*Cancer gammarus*, Fig. 74) is a well-known crustaceous animal, distinguished by its long and jointed tail, its shell being smooth, and having betwixt the eyes a kind of beak toothed on each side, and with a double tooth at its base.

These animals are of bluish black colour when alive, but, in boiling, this changes to a dingy red. They sometimes grow to an immense size.

Lobsters are found among marine rocks in nearly all parts of Europe.

They are caught much in the same manner as crabs (263). The London markets are supplied with great

numbers of lobsters from the Orkney Islands and the eastern parts of Scotland, and even from the coast of Norway. It is said that in London lobsters are sometimes boiled every day for a week or longer, to keep them sweet externally; but, notwithstanding this precaution, their inner parts become putrid. An immoderate use both of lobsters and crabs is sometimes attended with irruptions in the face, or a species of nettle rash over the whole body; and, when eaten in a state approaching to putrescence, they are sometimes productive of still more disagreeable effects.

When selected for the table, lobsters ought to be heavy in proportion to their size, and to have a hard and firm crust. During winter the male lobsters are generally preferred for the table. These are distinguished by the narrowness of their tail, and by the first two fins beneath being large and hard. The females, on the contrary, are broader in the tail, and have these fins small and soft. The roe or eggs are found under the tail of the females for some time after they have been protruded from the body, and in this state the females are generally preferred to the males. When fresh, the tails of lobsters are stiff, and pull open with a spring, but when they are stale the joints of the tail become flaccid.

266. *The SEA CRAW-FISH, or SPINY LOBSTER* (*Cancer homarus*), is a crustaceous animal, distinguishable from the common lobster, by its shell being covered with spines, and by each of the legs ending in a hairy claw.

This species is of large size, and is found in most of the European seas.

Sea craw-fish are very common in the London markets, where they are sold at a price inferior to that of the common lobsters. Their flesh is hard, and has a peculiar sweetness, which by many persons is much disliked. At Marseilles, and on the coast of the Mediterranean, however, they are in considerable request on account of their eggs, which are esteemed a great delicacy. These begin to appear towards the

end of May, and are cast about two months afterwards.

267. The *COMMON, or FRESH-WATER CRAW-FISH* (*Cancer astacus*), is a small crustaceous animal, in shape somewhat resembling a lobster, and distinguished by having its large claws beset with numerous tubercles, and the beak between its eyes being toothed on each side, and having a single tooth at the base.

It inhabits holes in the clayey or stony banks of many of the rivers of England, and is seldom known to exceed the length of three or four inches.

Craw-fish are frequently used in cookery; and their flesh is considered nutritive, but somewhat indigestible.

Those substances which in medicine are improperly denominated *crabs' eyes* are concretions formed within the thorax of the craw-fish. They are generally about the size of peas, or larger, somewhat flattened on one side, and of whitish colour. The principal part of them are brought from Muscovy, and particularly from the banks of the river Don.

In England the usual mode of catching craw-fish is by cleft sticks, baited with flesh or garbage, and stuck in the mud near their haunts at the distance of a few feet from each other. After being suffered to remain some time, these are gently drawn up, and a basket is put under them to receive the animals, which always drop off as soon as they are brought to the surface of the water.

268. The *COMMON SHRIMP* (*Cancer crangon*), is a very small crustaceous animal, somewhat shaped like a lobster; having four antennæ, the two interior ones short and double, with two thin projecting laminae beneath them, and on each of the large claws a single moveable fang.

Shrimps are common in shallow parts of the sea where the bottom is sandy.

269. The *PRAWN* (*Cancer squilla*, Fig. 75), is a small crustaceous animal, which differs from the shrimp in having a projecting and sharply serrated horn in front of its head,

four antennæ, of which the two interior ones are long, and each in three divisions, and on each of the large claws two fangs.

It is found in many parts of the European ocean.

Both these species are in great demand for the table, the former chiefly as sauce, and the latter to eat as a relish at breakfast or with the last courses at dinner. They are an agreeable repast, and more easily digestible than either crabs or lobsters.

The mode in which they are caught is generally by a kind of net called a putting net, which is fixed to the end of a long pole, and pushed along upon the sand in shallow water. Prawns in some places are caught in wicker baskets, similar in shape to those which are used for the catching of crabs (263).

CLASS VI.—WORMS.

270. The MEDICINAL LEECH (*Hirudo medicinalis*), is a worm-shaped animal of olive-black colour, with six yellowish lines on the upper part of the body, and spotted with yellow beneath.

When fully extended, the leech is generally two or three inches in length. It is found in stagnant and muddy waters.

The use of leeches in medicine is to diminish the accumulation of blood in any particular part of the body. This they do by fixing themselves to the spot, forming a hole with three sharp teeth which are situated triangularly in their mouth, and sucking the blood through the wound. When they have drawn sufficient, they are easily loosened by putting upon them a small quantity of salt, pepper, or vinegar.

Leeches are caught in various ways, but one of the best is to throw bundles of weeds into the water which

they inhabit. These, if taken out a few hours afterwards, will generally be found to contain a considerable number. They are collected from several of the rivers in the south of England, and are kept for sale sometimes, many thousands together, in casks or tubs of spring water. This is frequently changed, and all the slime and filth which exude from their bodies is carefully washed away.

It is said that if leeches be kept in glass vessels they will indicate a change of weather, by becoming at such times peculiarly restless and active.

271. *The OFFICINAL CUTTLE-FISH* (*Sepia officinalis*), is a marine animal, with somewhat oval body nearly surrounded by a margin, eight short and pointed arms, and two tentacula four times as long as the arms, all furnished with numerous small cup-shaped suckers.

These animals are found in considerable numbers in the European seas.

By the ancients, cuttle-fish were in great esteem as a delicacy for the table; and, even at the present day, they are frequently eaten by the Italians, and by the inhabitants of other countries on the shores of the Mediterranean.

There is, in the middle of their body, an oval bone, thick in the middle, and thin and sharp at the edges, light, spongy, and of whitish colour. These bones were formerly employed in medicine, and are still kept in the druggists' shops. When dried and pulverized, they are used by silversmiths as moulds, in which they cast spoons, rings, and other small work. When burnt or calcined, they are useful for the cleaning and polishing of silver and other hard substances, and sometimes for correcting the acidity of wines.

The body of the cuttle-fish is furnished with a vessel that contains a considerable quantity of dark-coloured or inky fluid, which the animal emits into the water, to conceal its retreat when alarmed by the approach of its enemies. And it is generally supposed that the article called *Indian ink* is this black fluid, in an inspissated or

hardened state, and perfumed with musk and other substances.

272. The PEARL-BEARING MYA (*Mya margaritifera*) is a testaceous animal, having an oblong double or bi-valve shell of somewhat oval shape, but narrower towards the middle than at the ends, and covered externally with a dark-coloured rough epidermis or skin, except on the protuberant parts near the hinge: one of the shells at the hinge has a single tooth or prominent part, which fits into a forked one in the other.

The general depth of the shells is two inches, and breadth about five inches.

Pearl-bearing myas are found in fresh-water rivers in many parts of Britain, and in those of most other countries within the arctic circle. The river Tay in Scotland, and the Conway in Wales, are particularly noted for them.

In the river Tay some of these shells are found to contain good pearls; but fine ones are very scarce, and the greater part are of little or no value. They are of various shapes, round, oval, or elongated, and cylindrical, hemispherical, and resembling buttons. Several of the oblong ones have a contraction towards the middle, which gives them the appearance of two pearls joined together.

Pearls are a calculus, or morbid concretion, formed in consequence of some external injury which the shell receives, particularly from the operations of certain minute worms which occasionally bore even quite through to the animal. The pearls are formed in the inside on these places. Hence it is easy to ascertain, by the inspection of the outside only, whether a shell is likely to contain pearls. If it be quite smooth, without cavity, perforation, or callosity, it may with certainty be pronounced to contain none. If, on the contrary, the shell be pierced or indented by worms, there will always be found either pearls or the embryos of pearls. It is possible, by artificial perforations of the shells, to cause the formation of these substances. The process which has been chiefly recommended is to drill

a small hole through the shell, and to fill this hole with a piece of brass wire, rivetting it on the outside like the head of a nail; and the part of the wire which pierces the interior shining coat of the shell will, it is said, become covered with a pearl.

As to the value of British pearls, some have been found of size so large as to be sold for 20*l.* each and upwards; and 80*l.* was once offered and refused for one of them. It is reported in Wales, that a pearl, from the river Conwy, which was presented to the queen of Charles the Second, was afterwards placed in the regal crown.

273. *The ORIENTAL PEARL MUSCLE* (*Mytilus margaritiferus*) to which we are indebted for nearly all the pearls of commerce, has a flattened and somewhat circular shell, about eight inches in diameter; the part near the hinge bent, or transverse, and imbricated (or covered like slates on a house) with several coats which are toothed at the edges.

Some of the shells are externally of sea-green colour, others are chestnut, or reddish with white stripes or marks; and others whitish with green marks.

These shells are found both in the American and Indian seas.

The principal pearl fisheries are off the coasts of Hindostan and Ceylon. The fishing usually commences about the month of March, and occupies many boats and a great number of hands. Each boat has generally twenty-one men, of whom one is the captain, who acts as pilot; ten row and assist the divers, and the remainder are divers. The latter go down into the sea alternately by five at a time. To accelerate their descent they have a perforated stone of eighteen or twenty pounds weight, fastened by a cord to their great toe, or to some other part of their body. The depth of water through which they pass is from four to ten fathoms; and they collect the muscles into a bag of net-work which they hang about their necks. When desirous of ascending, they pull a rope as a signal to their companions in the boat to draw them up. They

are often known to descend as many as forty or fifty times in a day, and at each plunge to return with more than a hundred shells. The usual time for the divers to remain under water does not much exceed two minutes, though some are able to continue immersed more than five minutes.

When the muscles are taken out of the boats, they are placed in heaps on the shore, where they continue about ten days, till the animals become quite putrid. They are then opened and searched for the pearls. One muscle sometimes contains many pearls, a hundred and upwards, large and small; and sometimes a hundred muscles have been opened without yielding a single pearl large enough to be of any value.

The pearls are sorted according to their size, by being passed through large brass sieves, or through saucers with round holes in the bottom. After having been sorted, they are drilled; and then washed in salt water to prevent any stains which might be left by the drilling. The arranging of them on strings is considered the most difficult task of a pearl merchant, in consequence of the correctness of judgment which is requisite in classing them according to their value.

The value of pearls is estimated by their size, roundness, colour and brightness. A handsome necklace of pearls, smaller than large peas, is worth from 170*l.* to 300*l.* whilst one of pearls not larger than pepper-corns may not be worth more than 20*l.* The King of Persia has a pear-shaped pearl so large and pure as to have been valued at 110,000*l.* sterling. The largest round pearl that has been known belonged to the Great Mogul, and was about two-thirds of an inch in diameter. Pearls from the fishery of Ceylon are considered more valuable in England than those from any other part of the world. The smaller kinds are called *seed* or *dust pearls*, and are of comparatively small value, being sold by the ounce to be converted into powder.

Nacre or *mother-of-pearl* is the inner part of the shell of the pearl muscle. This is of a brilliant and beauti-

fully white colour, and is usually separated from the external part by aqua-fortis, or the lapidary's mill. Pearl muscle shells are on this account an important article of traffic to China and many parts of India, as well as to the different countries of Europe. They are manufactured into beads, snuff-boxes, buttons, and spoons, fish and counters, for card-players, and innumerable other articles.

The pearl muscles are not considered good as food; though, after having been dried in the sun, they are sometimes eaten by the lower classes of people in the countries near which they are found.

274. *The COMMON or EDIBLE MUSCLE* (*Mytilus edulis*, Fig. 79) is a testaceous animal, with a smooth double or bivalve shell of oblong oval form, pointed, and slightly keel-shaped at the beak, flattened and somewhat curved on one side.

The colour is generally blackish, and the length about three inches.

This species of muscle is found adhering to sub-marine rocks by certain silky threads, which it forms from its own body; and it is common both in the Indian and European seas.

In many parts of Europe muscles are nearly as much in request for the table as oysters; and at Rochelle, and some other places, modes are adopted of increasing their excellence, by placing them, after they are taken from the sea, in pools or ditches where the sea-water is stagnant, and introduced only at particular periods as it is wanted. Muscles are caught nearly through the whole year, though they are considered best in the autumn.

To some constitutions they are an unwholesome food, producing inflammation, eruptions on the skin, and an intolerable itching over the whole body; the best remedies for which are said to be a liberal use of oil, emetics, or milk.

275. *The OYSTER* (*Ostrea edulis*, Fig. 77) is a testaceous animal, too well known to need any description.

It is found affixed to rocks, or in large beds, both in the European and Indian seas.

The use of oysters as food has rendered them celebrated in all ages. The ancient Roman writers speak of them as in great request by that luxurious people. Pliny relates that in his time they were considered so exquisite as, when in perfection, to have been sold for enormous prices; and that Apicius, the notorious epicure or glutton, invented a peculiar method of preserving and fattening them.

Of all the European oysters, the largest are those that are caught off the coast of Normandy, and with which Paris is principally supplied. But the best are of middle or somewhat small size, and are caught in the waters of Malden and Colne in Essex, or near the mouth of the Thames. They are dredged up by a net (with an iron scraper at the mouth) which is dragged by a rope from a boat over the beds; and then stored in large pits formed for the purpose, and furnished with sluices through which, at spring tides, the salt water is suffered to flow. In these pits they acquire their full quality, and become fit for the table in six or eight weeks. The most delicious oysters are considered to be those which are fattened in the salt-water creeks near Milton in Kent, and Colchester in Essex.

Oysters are out of season during the summer-time, the period at which they deposit their spawn, and which commences in the month of April. Each spawn has the appearance of a drop of candle-grease, and adheres to rocks, stones, or other substances on which it happens to be deposited. In some oyster-beds, old shells, pieces of wood, &c. under the denomination of *cultch*, are purposely thrown in to receive the spawn. From these, in the month of May, the oyster-fishers are allowed to separate the spawn for the purpose of transferring it to other beds; but they are required, under certain penalties, to throw the *cultch* in again, that the beds may be preserved for the future; unless the

spawn should be so small as not with safety to be separable from the cultch.

Oysters are considered to be first fit for the table when about a year and half old; and they are among the few animals which in Europe are not merely eaten raw, but even in a living state. Oysters are also eaten cooked in various ways, as sauce to different kinds of fish, and pickled.

The *shells*, like those of other testaceous animals, consist of calcareous earth in combination with animal glue; and, by calcination, they yield a pure kind of quick-lime. In this state they are not only useful as lime, but are also frequently employed by stationers and attorneys as pounce for rubbing upon parchment previously to its being written upon.

276. *The GREAT SCALLOP* (*Pecten Maximus*, Fig. 78) is a testaceous animal with a double shell, flat on one side, and convex on the other, with about fourteen rounded ribs, which are longitudinally grooved, and a projection or ear on each side of the hinge.

The shells, when full grown, are about five inches long, and six inches broad.

By some persons scallops are thought better eating than oysters; and the ancients held them in great esteem. In several parts of France they have the name of "Coquilles de Saint Jacques," from the Catholics who annually visit the shrine of St. James of Compostella, in Spain, placing the shells in their hats as a testimony of this pilgrimage. These shells are also worn by pilgrims to the Holy Land.

277. *The COCKLE* (*Cardium edule*, Fig. 80) is a small and well-known testaceous animal with a double convex shell, somewhat deeper on one side than the other; and marked by twenty-eight depressed ribs, which are streaked or slightly furrowed across.

Cockles are perhaps more generally eaten in England than in any other country of the world: and they

are a wholesome and, to many persons, an agreeable food, but, if eaten raw, they are supposed to produce poisonous effects. Cockles are generally found on sea coasts, immersed at the depth of two or three inches in the sand. They are dug up at low water, and the places where they are concealed are known by small, circular, and depressed spots in the sand. Cockles are chiefly in request during the winter months. They are sometimes pickled, and sometimes converted into ketchup.

278. *The GREAT PINNA, or SEA WING* (*Pinna nobilis*) is a testaceous animal with a double or bivalve shell, of nearly triangular shape, open at the broader end, longitudinally striated, the scales channelled and tubular, and somewhat imbricated.

Its length is sometimes more than fourteen inches, and its greatest breadth six or seven inches.

These animals are found in great abundance in the Mediterranean; and in the sea near some parts of the coast of America.

From the most remote periods of antiquity the *byssus*, as it has been denominated, or silky threads by which these animals affix their shells to rocks or stones at the bottom of the sea, has been spun and woven into different articles of dress. For this purpose the shells are dragged up by a kind of iron rake with many teeth, each about seven inches long, and three inches asunder; and attached to a handle proportionate to the depth of water in which the shells are found. When the *byssus* is separated, it is well washed, to cleanse it from impurities. It is then dried in the shade, and straightened with a large comb; the hard part from which it springs is cut off, and the remainder is properly carded. By these different processes it is said that a pound of *byssus*, as taken from the sea, is reduced to about three ounces. This substance, in its natural colour, which is a brilliant golden brown, is manufactured in Sicily and Calabria (with the aid of a little silk to strengthen it) into stockings, gloves, caps,

waistcoats, and other articles of extremely fine texture. All these, however, are to be considered rather as curious than useful; and the manufacture of them is every day declining.

279. *The EDIBLE SNAIL* (*Helix pomatia*), is a shell animal distinguished by its large size, nearly globular shape; being of brownish white colour with usually three reddish horizontal bands, somewhat striated longitudinally; and having a large and rounded aperture with thickened and reflected margin.

It is sometimes more than two inches in diameter; and is found in woods and hedges in several parts of Europe, and occurs in those of some of the southern counties of England.

By the Romans, towards the close of the republic, when the luxury of the table was carried to the greatest height of absurdity and extravagance, this species of snails were fattened as food, in a kind of stews constructed for the purpose, and were sometimes purchased at enormous prices. The places for feeding them were usually formed under rocks or eminences; and, if these were not otherwise sufficiently moist, water was conveyed into them through pipes bored full of holes like those of a watering pot. They were fattened with bran and the sodden lees of wine.

In France, Germany, and other countries of the Continent, these snails are at this day in great request for the table: and are chiefly in season during winter and the early months of the year. They are boiled in their shells, and then taken out, washed, seasoned, and otherwise cooked according to particular palates. Sometimes they are fried in butter, and sometimes stuffed with force-meat; but, in what manner soever they are dressed, their sliminess always in a great measure remains. They are generally kept in holes dug in the ground, and are fed on refuse vegetables from the gardens.

These snails are frequently used by females in France, as a cosmetic, to preserve the skin of the face soft and delicate.

280. *CORAL* (*Corallium nobilis*) is a hard, stony, branched, and cylindrical substance which is formed, at the bottom of the sea, by certain minute animals called polypes, that issue from the branches, and are white, soft, semi-transparent, and each furnished with eight tentacula or feelers.

The general appearance of coral is that of a shrub destitute of leaves; and its height is usually from three to four feet.

It is found in great abundance in the Mediterranean and the Red Sea.

To the inhabitants of Marseilles, Catalonia, and Corsica, the coral fishery is a very important pursuit; and the principal parts of the Mediterranean from which coral is obtained are the coasts of Tunis and Sardinia, and the mouth of the Adriatic Sea. The British government has, within the last few years, concluded a treaty with the Barbary powers, for liberty to fish for coral in their waters. The coral thus obtained is conveyed chiefly to Malta and Sicily, is there wrought into beads and other ornamental forms; and thence is imported into this country. Previously to this arrangement the principal import of coral was from Leghorn.

The mode of obtaining coral is by a very simple machine, consisting of two strong bars of wood or iron tied across each other, with a weight suspended from their centre of union. Each of the arms is loosely surrounded, through its whole length, with twisted hemp; and, at the extremity, there is a small open purse or net. This machine is suspended by a rope, and dragged along those rocks where the coral is most abundant; and such as is broken off either becomes entangled in the hemp, or falls into the nets.

Coral is bought by weight: and its value increases in a certain ratio according to its size. Beads of large size are worth about forty shillings an ounce, whilst small ones do not sell for more than four shillings. Large pieces of coral are sometimes cut into balls, and exported to China, to be worn in the caps of certain persons, as an insignia of office. These, if perfectly sound and of good colour, and upwards of an inch in

diameter, have been known to produce, in that market, as much as 300*l.* to 400*l.* sterling each. There are extant many beautiful pieces of sculpture in coral; as this substance has in all ages been considered an admirable material on which to exhibit the artist's taste and skill. Probably the finest specimens of sculptured coral that are known are a chess-board and men, in the Tuilleries.

The Chinese have, within the last three or four years, succeeded in cutting coral beads of much smaller dimension than has hitherto been effected by any European artist. These, which are not larger than small pins' heads, are called *seed coral*, and are now imported from China into this country in very considerable quantity for necklaces. Nearly the whole of the coral that is used is of *red* colour; *white coral* being considered of little value either as an article of commerce or decoration. There are modes of imitating coral so exactly, that, without a close inspection, it is sometimes impossible to discover the difference betwixt the real and the counterfeit article.

281. SPONGE (*Spongia officinalis*) is an animal substance of soft, light, porous, and elastic nature, which is found adhering to rocks at the bottom of the sea in several parts of the Mediterranean, and particularly near the islands of the Grecian Archipelago.

The general uses of sponge, arising from its ready absorption of fluids, and distension by moisture, are well known, and of great importance. It is collected from rocks, in water five or six fathoms deep, chiefly by divers, who, after much practice, become extremely expert in obtaining it. When first taken from the sea, it has a strong and fishy smell, of which it is divested by being washed in clear water. No other preparation than this is requisite previously to its being packed up for exportation and sale. The growth of sponge is so rapid that it is frequently found in perfection on rocks

from which, only two years before, it had been entirely cleared. It is principally imported into this country from the Levant.

Sponge is sometimes used by surgeons for the dilating of wounds; and, as it adheres strongly to the mouths of wounded vessels, it is occasionally applied as a styptic to prevent their bleeding. Sponge burnt in a close earthen or iron vessel, and then reduced to powder, is sometimes used as a medicine.

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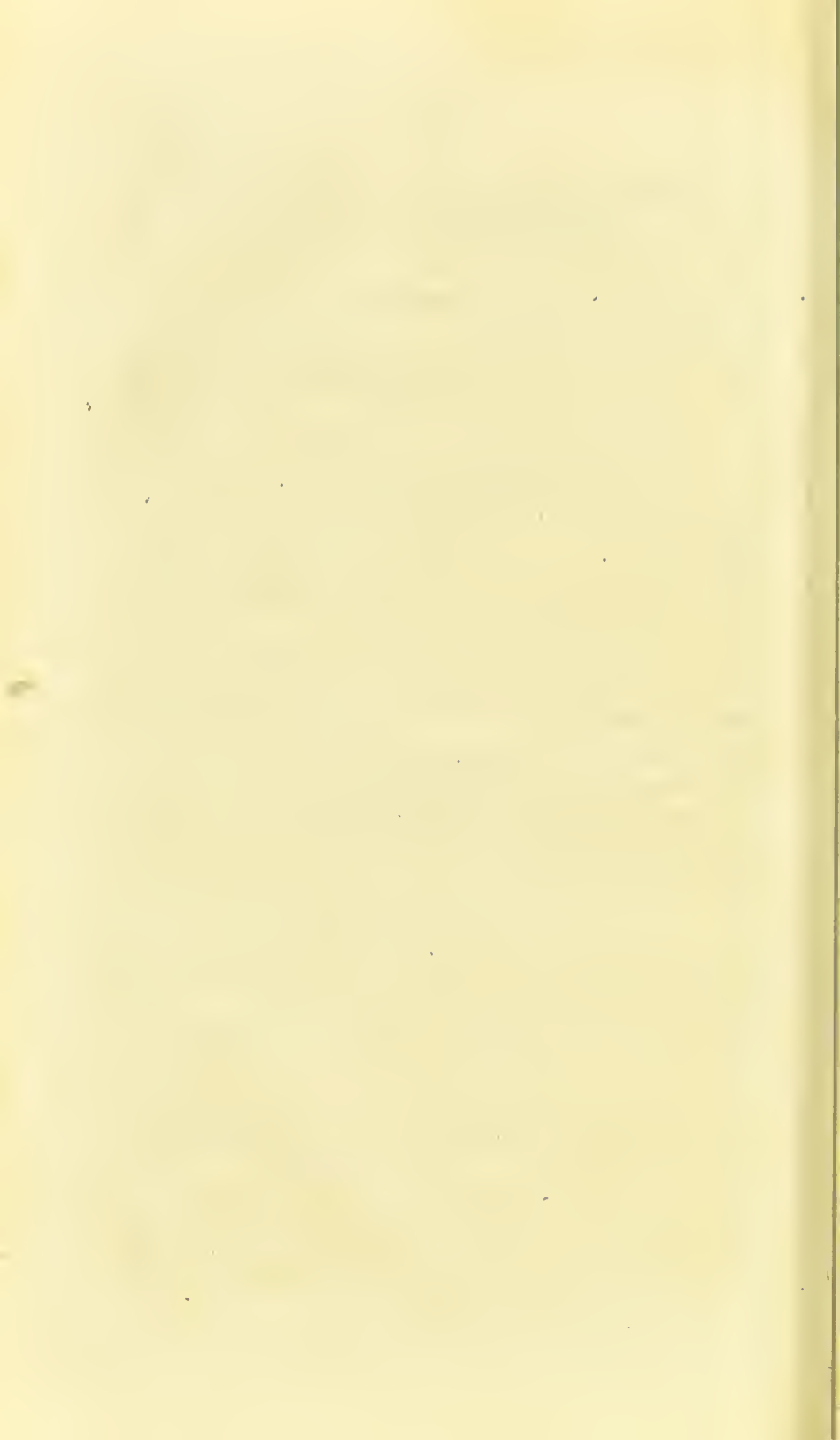
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